The Mistery of Husbandry or Arable Pasture and Wood Land Improved
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Harfordshire Wheele Plough
The Frenching Spade
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THE

Mystery of Husbandry

OR,

Arable, Pasture, and Wood-land

IMPROVED.

Containing the whole Art and Mystery of Agriculture or Husbandry, in Bettering and Improving all sorts of Land, fertilizing the barrenest Soil, cleansing it from Weeds, Bushes, Stubs, Flags, Overflowings of fats or standing Waters, to bear good Corn, or become Meadow or Pasture.

Directions for Marling, Dunging, Shadding, Sanding, Flowing, Trenching, and other Methods of improving Land to the best advantage.

Proper Times for Sowing, Planting, Grafting, Ploughing; with the Description of such Plows suitable to the different Sorts of Ground, &c.

How to keep Corn, and other Fruits, from being destroyed by Flies, Worms, Mildews, Blights, Smuttiness, cold Winds, &c. Also how to prevent Ianing or Sparking, &c.

The best Ornaments for preserving Corn and Fruit, &c.

How to know Seasons, or predict Corn from Weather.

Proper Tools for Husbandry and Dairies, &c.

Improvement of Land by Terraces, Gardens, Arbors, Hedges, Hops, Woad or Weld, Coleworts, Flax, Clover, &c. Furze, &c.

Woodland or Coppice, its Soiling, Improving, and raising it to a vast Increase; the great Advantage thereof, &c.

To which is added,

The Countryman's Astrology, &c.

BY LEONARD MASCALL.

LONDON: Printed by W. Godbid, for Simon Miller, at the Star and Bible in Cornhill. 1672.

THE PREFACE TO THE READER.

READER,

HAving well weighed and considered with mature Deliberation, that a Work of this nature cannot but be grateful to my Country, I have the more laboured to bring it to the highest Pitch of Improvement, supplying what has been omitted by others, who have with some Diligence and Industry attempted to compile a compleat Body of Agriculture; or to lay down such material things, as might redound to the bettering the Knowledge of the Ingenious Countryman, to make his Charge and Labour answer his Expectation, but have, in many matters, upon Experience, come short of what was, no doubt, well meant, because most of them had not practised what they writ, but

were obliged to borrow them from others, and take them on Truſt, and many of them from Foreign Authors; not well conſidering, that differing Climates produce different Effects, though things are managed one and the ſame way: For what the Ground in one Country will kindly produce, that in another, through too much Heat, Cold, or Moiſture, will not, though the Soil be much of the like Temper; in which, were it not for Brevity's ſake, I could give many convincing Inſtances.

Theſe things, I ſay, conſider'd, I have grounded this Work upon long Experience, and fully proved to my great Advantage whatever I have laid down; which I have done in as eaſie a Method, and as practicable as can be; and, as I think, have omitted nothing that is proper for ſuch a Treatiſe. I have given you the proper Manures, the Nature of the ſeveral ſorts of Lands, and the beſt way of improving them from little or no Value to great Advantage. Alſo an exact Method for draining all ſorts of Land, and for floating it, as occaſion requires; with the Deſcription of Tools, and proper Engins for the Work and Management: The beſt Methods for Ploughing and Sowing, the laying of Land, and the diſtributing of Grain, and every thing elſe that is neceſſary, from its ſpringing up, till it is ſold and delivered in the Market. To which I have ſubjoined many other rare

and

and profitable Improvements of Barren Land, known to few, and practised by less; because some have already been discouraged herein, for want of well-grounded Notions to further them in the true Experiment; it being too much the Nature of English-men, in matters of expected Profit, to be too soon discouraged, if things at first fail to succeed to their Wish.

I have further considered every thing that is useful relating to Wood-lands, or Improvement of Lands to a vast Value, by setting Trees, with all the Measures of ordering them; and laid down many convincing Reasons for the promoting of Inclosures, answering the Objections of Commoners, and others, who oppose it, to their own great Disadvantage, out of Obstinacy or foolish Custom, when by this means vast numbers of poor People might be set on work at present, and for the future be well maintained, if not enriched by the Advantage arising thereby.

And, to make this Work more compleat, I have added an Almanack, containing Prognosticks of Weather, Seasons, Observations of the Year from Critical Days, and what is proper in many Particulars to be observed in every Month, as well in Affairs, as to keep and order the Body, and to continue it in a healthful Temper, and for Seven Years to come. Among sundry other things, too tedious here to mention, I have set down the exact

falling out of the Movable Festivals, and when the Movable Terms begin and end. So that, I conceive, I have laboured to the purpose, and therefore cannot but reasonably hope, this Work will find Acceptance. In expectation whereof, that I may be the further encouraged to do for the publick Good, I am, kind Reader,

Your Friend and Humble Servant,

L. M.

THE

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THE
Mystery of Husbandry:
OR,
Arable, Pasture, and Wood-Land
IMPROVED.

The INTRODUCTION.

Of the Excellency, Necessity, and Usefulness of the Advancement of Good Husbandry.

THE Excellency of Husbandry appears by its Antiquity, as we esteem Things the more Admirable, the more Ancient, and the nearer they come to God, the first Being of all Beings; for as all Things nearer the Centre move more strongly, so all Excellency appears most evidently the nearer (if I may speak with Reverence) I am to the great Majesty, the Almighty Husbandister, God himself. First, in his Making the World, he made all Creatures, all Plants, Fruits, Trees, Herbs, and all Things bearing Seed for the Food of Man and Beast; God also made these most Excellent and Glorious Creatures, as the Light, the Day, the Firmament, the Earth, and Sea, the Sun, Moon, and Stars, all to be Serviceable, and Ministers to the Creatures Relief, and all the Creatures subservient to Man,

and Man to Overlook, Cherish, and Improve the Fruits of the Earth, and Dress and Keep them for the Use of the whole Creation. So that God was the Original and Pattern of all Husbandry, and First Contriver of the Great Design, to bring that odd Mass, and Chaos of Confusion, unto so vast an Improvement, as all the World admires and subsists on: And having given Man such a Pattern, both for Precept and Precedent for his Encouragement, he made him Lord of all until he fell; and after that, God intended the Preservation of what he made, notwithstanding the Great Curse upon *Adam*, *Eve*, and the *Serpent*, the Earth not being free from it, but a Curse of Barrenness cast upon it also, yet *Adam* was sent forth to Till the Earth, and Improved it, in the Sweat of his Face he must eat Bread, until he return to the Earth again; and so down to *Abel*, the one Husbanding the Earth for Tillage, and the other the Sheep, in Pasturing and Grazing; and so down to *Noah*, the first Planter of the Vine, he began as [illegible] Husbandmen; and to *Abraham*, and to *Jacob*, and to *Job*, and so down from the Patriarchs, till they came to the Government of Kings, where *Uzziah*'s Commendation was, *That he loved Husbandry*, 2 Chron. 26. 11. And many excellent Things, as if Husbandry were most exceeded [illegible] it is, here on Earth, where *Solomon*, the wisest King, was the Second Husbandman, or Improver of the World, whom you shall find, out of the Experience of his Experience, to cry up Diligence and Activity in good Husbandry, and therefore he sendeth us to the Pismire, declaiming against the Sluggard and Slothful, *Go to them, saith he, consider their ways and be wise*. He exalts the Diligent, as fitter to Converse with Kings, when the Slothful shall be under Tribute. For the Usefulness of it, it is all one with the Maintenance of our Lives, Estates, the Commonwealth, and an Advancement and Improvement of the Fruits and Profits of the Earth by Ingenuity, is little less than an Addition of a New World; for what is gained hereby, either above the Natural Fruitfulness of the Earth, or else by Redeement of that which is Destroyed, or Impoverished from its Natural Fruitfulness, to a greater Fertility, is a clear Argumentation and

Addition

Addition to the Honour and Profit of our *English* Nation: All other Callings but proceeding hence, the Earth being the very Womb that bears all, and the Mother that must nourish and maintain all. The Merchant is a gallant Servant to the Common-wealth, he fetches his Riches from far, and he is a worthy Contributer to the Wealth and Prosperity of the Kingdom; but he produceth it from others, who could themselves make great Profit of it, and though he gaineth a great Estate, yet he raiseth it not out of nothing, but parts with Gold and Silver, and with Commodities for it: But this Merchant of Husbandry, he raiseth it out of the Earth, which otherwise would yield little, unless his Ingenuity digged and fetched it out; otherwise, possibly it had never been so discovered, as to have been there. And what parts he with for it? What Rate purchaseth he it at? Even only by his ingenuous Industry, and with the Wages of the Labouring Man, whom he is bound both by the Laws of God and Nature, to allow a Competent Maintenance. Oh, the Excellency, Integrity, and Use of Husbandry; *Prov.* xi. 26. *A blessing is on the head of him that selleth corn, and the thoughts of the diligent bring abundance.* To conclude with few words: As for the Terms of Husbandry, I resolved to deliver my self in our own Native Country's ordinary and home-spun Language, not slighting those ancient Terms which are used in several Countries, the better to acquaint my Countrymen with them; all which I shall do as briefly as possibly I may, to render my self acceptable to my Reader's clearest Apprehension.

CHAP. I.

How to know the Goodness of the Ground.

MAny count that to be the best Ground, that lieth at the foot of a Hill, being level, and towards the Sun, in Cold and Northerly Countries, it is good to have the Land to be East and South, least these two Quarters, being hard off by an Hill, the Land be frozen with Cold: but in hot Countries, it is better to have the Ground lie North: both for Pleasure and Health. You may sooner know the Conditions of every Ground, than of Men themselves; for the Ground being well Tilled, can hardly deceive you. To know the Nature therefore of every Ground, you must mark well the Plants, and the Yield of the Country, except you will lose your Labour, look whether there be in the Land, either Stone, Marle, Sand, Gravel, Raddel, Chalk, Clay, Preble, or Carbuncle, that is, Ground over-heated and parched with the Sun, which will burn the Roots of whatsoever cometh in it. Also, if it be wet or weeping Ground, or subject to such other Inconveniences, and such Ground also, according to the Natures of the Soyl, is good or evil. In some Countries the Ground is altogether barren, especially for Corn and Fruit: in other Places again, they use Stones in the Manuring and Bettering of their Ground. In some places for Heavy and Hilly Ground, Oats do prosper best. In like manner also, in all Countries, you must regard the Layre of the Country, and the Nature of the Seed that we sow: for Gravel in some places is cast upon the Ground, instead of Dung, and some Things prosper best in Gravelly Ground. It is also something to the purpose, whether the Gravel be White, Red, or Yellow: besides, pure Ground doth deceive both with Colour and Quality. In some Countries the black Mould is only esteemed: in others, the fat red Mould is thought best. In other places the chalky Ground beareth good Corn, and Pastures very well. In some place

places the fatter and clammy Ground is most fruitful; in all these it is to be learned, what is best for the hilly Ground, what for the Valley; what for the Tilled, what for the Lay Ground, what the most Sedgy Ground requires, and what the Dry and Barren. Also in Planting, what Ground is best for Vines, what for other Trees, what delights in dry Ground, and what in moist Ground. *Virgil* commendeth a Ground that is fat; for such Ground is Tilled with smallest Charge and Labour: the next, that which is fat and stiff, which greatly recompenseth the Husbandman's Travail and Charges: the worst, is, that which is dry, lean, and stiff; for it is not only Tilled with great pains, but also, it doth not answer the Husbandman's Expectation in his Crop, neither at any time serveth it for good Meadow, or Pasture, and therefore such Ground is not to be medled withal. Also the Goodness of the Ground, may be easily perceived by these Signs, and following Tokens: For a cold Clod sprinkled with a little Water, if in working with the Hand it be Clammy, and cleaving, and sticketh to the Fingers like Pitch, when it is handled, and breaketh not in falling to the Ground, this sheweth a Natural Fatness and Richness of the Earth. Besides, you may know the Mould that is good for Corn, if it bear Bull-rushes, Thistles, Three-leaved Grass, Dunwort, Brambles, Black Thorn, and such like, as never grow (but for the most part) in good Ground: as on the other side, the loathsome and ill-favoured Weeds, declare a lean and a bitter Ground: Fern, and withered Plants, a cold Ground; red and heavy coloured, a moist and a wet Ground; a raddel and a stony Ground, is discerned by the Eye; a stiff and a tough Clay, by the Labour and Toil of the Oxen. It is also a Sign of a good Ground, where the Crows and Pies, in great Numbers, follow the Plough, scraping in the Steps of the Ploughman. The Goodness is likewise known, if at the Sun-setting, after a Rainbow, and in a Shower of Rain, following a Drought, it yieldeth a pleasant succour. Also, in Taste it will appear: if Tasting of a Clod that hath been Watered in an Earthen Vessel, you find it sweet, it is a sign of a rich Ground; if bitter, a great Token of bar-

ren Ground; if it be over fat, it is to be barrened, and not to be used. You must take Notice that Ground will also change, and of fruitful become barren; which hath been seen in several places of our Country. Besides, one kind of Ground, though it be never so fertile, will not bear all things. Moreover, the Disposition of the Heavens is a great matter, all Countries have not the Weather and Air alike; wherefore, it is the part of a good Husbandman, to know the Nature and Properties of his Ground, and to mark the Disposition of it for every Season of the Year: he must also consider, what Crop is best for every Layer. Some Ground serveth for Corn, some for Meadow, some for Pasture, neither may all things be well sown in rich Ground, nor nothing in barren Ground. Such things as need not much moisture, are best sown in light Ground; as the great Claver, Sperry, Chich, and the other Pulses that are pulled and not cut. Those that require much Sustenance, are sown in richer Ground; as Pot-herbs, Wheat, Rye, Barley, Linseed: some of them do good in the Year following, as Lupins, that are used to be sown for the bettering of the Ground. There is Difference also to be put, betwixt Fruits for Pleasure and such as are for Profit: as Fruit-Trees and Flowers, and such Things as yield both Pleasure and Sustenance, and are also profitable to the Ground. You must choose for Willows, Osiers, and Reeds, a wet and marshy Ground; and contrary, where you will have Corn and Pulse, that delights in dry Ground. Sperage, and such like, must be sown in shady places, and other Ground for Timber, Mast, and Fewel: yea, such Ground as is very gravelly and barren, hath its use, where you may plant Birch, and such like; and watry Grounds, where you may set Alders, Broom, Bullrushes, &c.

CHAP.

CHAP. II.

Of the Dunging of Ground.

SInce in all places the Ground is not of a like goodness, if we chance upon a lean, and a barren Ground, as heathy, brushy, and gravelly Ground, we must endeavour to make these fruitful, and to mend them by Art; for there is no Country that our most Gracious GOD hath left without sufficient Yield, if we use but our Industry, which may be happily employed divers ways, principally by Dunging, and diligent Labour. To which purpose, it will be necessary for us to know, what Dung doth most enrich the Earth: The most Expert of the Ancient Husbandmen, appoint three sorts of Dungs: the first of Poultry, the next of Men, the third of Cattel. Of the first sort, the best is had out of Dove-Houses; the next is of Pullins, and other Fowl, except Geese and Ducks, which is hurtful. The Ancients had such store of Poultry and Fowl, as the Dung of them is said to have sufficed for the Manuring of their Ground. The next to this, is Man's Ordure, if it be mixt with other Rubbish of the House: for of itself it is too hot, and burns the Ground. Man's Urine, being kept six Months, and poured upon the Roots of Apple-trees, and Vines, causeth them to be very fruitful, and giveth a pleasant Taste to the Fruit. In the third place, is the Dung of Camel, whereof the best is the Dung of Asses, because this Beast doth chew with the most leisure, whereby his Meat being well digested, is made the profitabler Dung. Next to this, is the Dung of Sheep, next of Goats, then of Oxen, and Horses. The worst of Swine, very hurtful to the Corn, but used in some Places for Gardens, for want of other Dung. It is a great Breeder of noysom Weeds. The Dung of Horses likewise, where they are fed with Barley, doth breed Weeds. The Lupine, before he bear his Cod, is most commended, being turned up with the Plough or Mattock, and laid in

Bundles about the Roots of Trees or Vine. Where they have no store of Cattel, they use to mend their Ground with Straw and Fern, and with the Stalks of Lupines, and the Branches laid together in some Ditch: hereunto you may cast Ashes, the Filth of Sinks and Privies, Straw, and other things raked together: but in the midst you must lay some sound Substance, against the Breeding of Adders and Snakes: also Hemlocks, Walwort, and the Weeds growing about Willow-Trees, and Fern, with other such rotten Weeds, you may gather and lay under your Sheep. They that dwell in gravelly and heathy Grounds, do take the Turfs of the Earth and Heath, and laying them in Heaps, powdred with a little Dung, suffer them to lie and rot, and after lay it on barren Ground, but more especially when they keep great store of Sheep, they cast into their Folds such Turfs pared from the Ground; *Columella* counts them but bad Husbands, that have of every one of the lesser kind of Cattel, less than a Cartload of Dung in Three hundred Days, and each of the greater sort ten Load, besides the Filth and Dirt of the Yards. This is also to be taken Notice of, that the Dung that hath lain a Year, is best for the Corn, for it both is of sufficient strength, and breedeth less Weeds; but upon Meadow and Pasture, you must lay the newest, because it brings most Grass; and this must be done in *February*, the Moon encreasing, for this is the best time to cause increase of Grass.

In the Manuring of your Ground, look that you lay most Dung upon the top of the Hill, for the Rain will drive it into the lower parts fast enough.

He that intends to have his Ground to bear much Corn, if he mean to Sowe in the end of the Summer, must turn in his Dung in *September*; if in the Spring, he may lay it on in any time of the Winter. What time soever he doth it, he must look that the Wind be Westerly, and the Moon in the Wayne. Besides, he must be sure, that the Dung be dry when he lays it on the Ground; for laying it on while it is moist, it doth more harm to the Ground than good, as daily Experience teacheth. Now as the Land will wax cold, if it be not Dunged, so will it be

dried

dried or burnt, if it be Manured yearly, or too much. The watry Ground requireth more ſtore of Dung, and the dry Ground the leſs.

In ſome places, the Scouring of Ponds and Ditches is uſed, to the great enriching of the Ground; in mountainous and barren Lands, they make their Land fruitful with laying on of Chalk; but long uſe of it makes the Ground ſtark nought: from whence it is grown a common Saying, *That Ground enriched with Chalk, makes a rich Father, and a beggarly Son.*

The River-Land, by overflowing, and faſt Ground with muddy, mingled with Sand and Gravel, will do very well.

CHAP. III.

The Nature, Uſe, and Benefit of Marl.

THE *Germans*, beſides other ſorts of Enriching their Grounds, do, in ſome places, inſtead of Dung, caſt upon it a kind of a Pitch and Fatneſs of the Earth, (*Pliny* would have it to be firſt deviſed in *England* and *France*) called, *Marga*, as it were, the Fat of the Land: it is gotten in deep Pits, but not alike in all Soyls. Queſtionleſs, Marle is a very uſeful thing, the Nature of it cold; which is the Reaſon that it ſaddens the Land exceedingly, and very heavy it is, and will go downward.

Some Countries yield Marle of ſeveral Colours, as 'tis affirmed of *Kent*, where 'tis found both Yellow, Grey, Blew, and Red; the Blew and Grey are counted the beſt: for to Marle together, I hold not proper; but when you reſolve to lay down your Land to Graze, be ſure at the laſt Crop you intend to take, (which may be two or three more after Marling) then Manure your Land with Dung, which will open, lighten, and looſen the Land: for the leſs binding, and the more light, looſe, and open, the more fruitful it is, ſo that it will produce a gallant Clovery.

The first Year after you have laid it down upon the Wheat, or mixed Corn-stubble, you should run it over again with Dung, and it will pay treble.

The Lands upon which Marle is most natural for increase, is upon the higher sandy Land mixed of Gravel, or any sound Land whatsoever, though never so barren, to which it is natural, and nourishing, as Bread to Man's Life.

CHAP. IV.

Of Ploughing, the Parts of the Plough, and the best Season for Ploughing.

IN Ploughing and Ordering, and right Preparing the Ground for Seed, consists the chiefest Point of Husbandry. The most Experienced affirm, That the first Point of Husbandry, is to Prepare the Ground; the second, to Plough it well; and the third, to Dung it well. The Fashions are divers, according to the Nature of every Soyl and Country. All great Fields are Tilled with the Plough and Share, the lesser with the Spade.

The Ploughs, some are single, some double, of sundry Fashions, according to the diversity of the Countries; some are with Wheels, some without.

The Parts of the Plough are, the Tail, the Shelf, the Beam, the Foot, the Coulter, the Share, the Wheels, and the Staff. The Share is that which first cuts the way for the Coulter, that afterwards turns up the Furrow, where the Ground is light, they use only a small Share.

In *Lapland*, they have for their Plough, nothing but a Fork. In *Syria*, where they cannot go very deep, they use (as *Theophrastus* saith) very little Ploughs. *Pliny* writes, that Wheels for Ploughs were devised by the *Frenchmen*, and called *Plaustra*, a *German* Name, which is corruptly printed *Plostrati*.

In

In divers places where the Ground is ſtiff, they have a little Wing on the right ſide of the Coulter, which Wing is to be removed to which ſide you liſt: with the Rod or Staff, well pointed, the Plough-man maketh clean his Coulter, when he works.

The Oxen muſt be yoaked even together, that they may draw the more handſomely, with their Heads at liberty, that their Necks may not be hurt. This kind of Yoaking is better liked of many, than to be yoaked by the Horns: for the Cattel ſhall be able to draw better with the Neck and the Breaſt, than they ſhall be with their Heads; and this way they put too the force of their whole Bodies, whereas the other way (being reſtrained by the Yoak, and their Heads) they are ſo vexed and hindred, as that they can ſcarcely race the upper part of the Earth.

Where Horſes may be uſed, they are more commodious for the Plough, and the fewer of them the better: for many Horſes draw too haſtily, and make too large Furrows, which is not good: whereas we ſee the Ground to be excellently well ploughed in *Gelderland*, and about *Cologne*, where they plough only with two Horſes, going very ſoftly.

In *France*, and other places, where they plough with Oxen, they make their Furrows rather deep than broad. Where the Ground is ſtiff, the Coulter muſt be the greater and the ſtronger, that it may go the deeper: for if the Cruſt of the Earth be turned up very broad, it remaineth ſtill whole, whereby neither the Weeds are killed, nor the Ground can be well harrowed. The Furrow ought not to exceed One hundred and twenty foot in length; for if it do, as ſome hold, it is hurtful to the Beaſts, becauſe it will be too wearieſome to them; but this Rule is not obſerved, as in the Countries where the Fields are great, their Furrows are drawn very long.

You muſt not plough in wet Ground, nor when after a long Drought, a little Rain falling, hath but wet the upper part, and not gone deep. If it be too wet when it is ploughed, it will do little good that Year, you muſt therefore obſerve, that the Seaſon be neither too dry,

nor

nor too wet: for too much drineſs cauſeth it, that it will never work well; for either the hardneſs of the Earth will reſiſt the Plough, or if it does enter, it breaks it not ſmall enough, but only turneth up great Flakes hurtful to the next Ploughing. For though the Land be never ſo rich, yet if you go any depth, it will prove barren, which is turned up with great Clods, from whence it proceeds, that the bad Mould mixt with the good, yieldeth the worſer Corn.

Where you have ploughed in a dry Seaſon, it will be convenient for you to have ſome moiſture in your ſecond ſtirring, which moiſtning the Ground, ſhall make your Labour the eaſier. When the Ground is rich, and hath long born Water, it is to be ſtirred when the Weather is warmer, and when the Weeds are full grown, and have their Seeds in their top, which being ploughed ſo thick, as you can ſcarce ſee where the Coulter hath gone, utterly killeth and deſtroyeth the Weeds: beſides, through many ſtirrings, your Fallow is brought to ſo fine a Mould, as that it ſhall need little or no Harrowing, when you Sowe it: for the old *Romans*, as *Columella* affirms, would ſay, That the Ground was ill huſbanded, that after Sowing had need of the Harrow.

Moreover, the good Huſbandman muſt try whether it be well ploughed or not, and not only to truſt to his Eyes, but to Experience with his hand, (otherwiſe the Balkes being covered with Mould) he may eaſily be deceived, ſo that he muſt be upon certain proof; to which purpoſe, let him thruſt down a Rod into the Furrow, which if it pierce alike in every place, it ſheweth that the Ground is well ploughed. If it be ſhallow in one place, and deep in another place, it ſignifies that the Ground was not well ploughed.

If you are to plough upon a Hill, you muſt plough overthwart, and not up and down: for thereby the inconveniency of the ſteepneſs is met withal, and the Labour both of the Men and Cattel is eaſed; but herein you muſt be careful, that you plough not always one way, but ſometimes higher, ſometimes lower, working aſlope as you ſhall ſee cauſe.

Touching

Touching the Season of Ploughing, it must be chiefly in the Spring; for in Summer the Ground is too hard, and in Winter too foul and dirty; but in the Spring, the Ground being mellow, is easily to be wrought, and the Weeds are then but turned in, which both does good for the Enrichment of the Ground; and plucked up by the Roots before they have seeded, will spring again: and therefore, for the most part, we begin to plough about the midst of *March*; but sandy and light Grounds, they use to be ploughed in the midst of Winter, if the Season will suffer.

Pliny is of my Opinion, that stiff Ground then should be stirred.

A slender and level Ground, subject to Water, should be first ploughed in the end of *August*, and stirred again in *September*, and prepared for Sowing about the twelfth of *March*.

The light hilly Ground is not to be broken up in Summer, but about the middle of *September*: for if it be broken up before, being barren, and without Juyce, it may be burnt up with the Sun, and have no goodness remain in it.

Wet Ground, some would have to be broken up after the Ides, or beginning of *April*, which being ploughed that time, should be stirred about the tenth of *June*, and after again. But those that are skilful in Husbandry agree, that in the tenth of *June*, without great store of Rain, you shall not plough; for if the Year be wet, I know nothing to the contrary, but that you may plough in *July*. In the mean time be very careful, that you meddle not with Ground that is over-wet.

CHAP.

CHAP. V.

Of Liming, Sanding, and Hacking Land, to make it fruitful.

THere are other Considerations relating to the well Ordering of Ground, than what I have already touch'd on, to clear and prepare them for Corn, Grass, Pulse, or other Things, useful and exceeding profitable:

If the Ground be barren, cold, or produces Weeds or Rushes, to help it, and bring it to a moderate Temper of Improvement for Fruitfulness, Lime is exceeding good. The Lime-stones may be got among Quarries of Stones, and in divers other places you may burn them in a Kiln, in the most convenient place you have, to save Charges of Carriage, and when you have before sanded your Ground, and hacked it, make your Lime small, and on every Acre bestow between thirty and forty Bushels of Lime, spreading and mixing it exceeding well with the Sand and Earth, and the stronger and sharper the Lime is, the better the Earth will be, and the Improvement will answer your Cost and Labour.

It matters not, of what Colour your Lime-stones are, whether of a pure White, or of a Grey, so they be sharp and strong in quality, to give a good Tincture to the Earth, it being the Strength and Goodness of the Lime, not the Beauty, that in this kind brings forth the Profit; and, indeed, it is a great Helper to Cold Grounds, especially Clay, or Wet-Grounds; and this is a great Preparer to laying Dung on these Lands; or any Soyl that is farming, either of Camel, or such as is cast out of Ponds, Lakes, or muddy Ditches, for barren and hard Earth can never be overlaid with good Manure, or Compost, seeing the want of Warmth and Fatness which these produce, was before the occasion of the Unfruitfulness.

As

As for the Hacking and Sanding mentioned, the first is after the Ground has been turned up with the Plough, to go over it with a long Hoe, or Hack, and cut in pieces the Grass that you see turned up in the Ridges, or Furrows, or any uneven Clumpers, that it may be dragged away, burnt, or carried together with the Weeds, not to grow up again to incumber the Corn, or Pulse; and Sanding is to bring Loads of Sand, lay them in convenient places, as Heaps of Dung, and spread them lightly, or thick, as you see occasion, over the Ground, that the Lime mixing with it, may the better Embody with the Mould, and Rain falling, be soaked in a good depth, to the heartning the Ground, and producing a good Crop to encourage the industrious Farmer.

CHAP. VI.

Of the First and Second Ploughing, and of Harrowing.

AS to the first manner of Ploughing of Ground that is barren, for the Improvement of it, if it lie free from Water, as commonly all even barren Earths do, then throw down the Furrows flat, and between every of them leave a little Bank, about half the breadth of the Furrow, and so go thorough and plough up the whole, without any regard to Difference or Distinction of Lands; but if there be danger of Annoyance of Water, lay the Furrows more near and high, dividing the Ground into several Lands, proportioning each of them to lie highest in the middle, that the Water descending may have free passage on either side; and when you have Hacked, Sanded, and Limed it, as before directed, come to your Second Ploughing.

In the Second Ploughing, penetrate the Ground deeper than at first, taking, as the Husbandmen call it, a good Stitch, to raise up Earth at the Quick, which before was

not

not stirred, make your Furrows deeper and greater, laying them closer and rounder together; and in this Order, or Latter Earing, be sedulous to plough it as clean as may be, leaving no Baulks, or any Escapes; and as you plough, have those that shall follow, to run it over with a Second Hacking; that is, with a heavy Share, Hoe, or Hack, to clear, or kill the Grass and Weeds, as also to lay it level.

This done, take a Pair of strong Iron-teethed Harrows, and go over the Ground, to open and rare that which was ploughed and hacked into smaller Particles, and raise the Mould lightly in greater abundance. Then take the best sort of that Grain you think fit to Sowe in it, and scatter it according to the Art of good Husbandry, suffering your Sprinkling to be a Medium, not too much nor too little.

The Seed being sprinkled on the Ground, make your Second Harrowing to cover it close and well, being careful to break all the Clots as near as possible, raising the Mould as fine and high as may be; that it may cover the Seed the deeper, and prevent the Rain washing it up, or the Birds, and other Vermine, from destroying it; for certain it is, that these cold, clayey, or barren Grounds, if not lightly raised, keep in and clog the Seed, which by reason of its roughness, cannot easily break through, or if it does, the Cold at the Roots, starve the Spires, and they mostly wither away, if not helped by Proper Means and Artful Labour.

As for Clotting the Earth, it is very proper in many Cases; for when you have Sowed and Harrowed the Ground, if notwithstanding some hard Clumpers remain, which will be in hard tough Earth subject to barrenness, which the Rain cannot dissolve, so that the Grain in vain may labour to get through them, to crumble these then, take a Clotting-Beetle, made of sound Wood, very hard, after the form of a Carpenter's Mallet, but with a much longer Handle, and heavier Head, and with it go over the Ground in a dry Season, and dash them to pieces, or to spread them the more, you may take a flat Board, much about two Inches in thickness, and a Foot broad, fastned

to

to a ſtrong Handle, that on neceſſity you may uſe with the force of both your Hands, in the manner of a flat Shovel.

CHAP. VII.

Of Weeding and Deſtroying the Weeds, with Directions to Order the Corn in Sowing, &c.

WEeds are very offenſive and deſtructive to Corn, in hindering its Growth; and therefore having brought you to beſtow your Corn in barren Ground, it is but reaſonable I ſhould tell how to preſerve it, that it proſper to anſwer your Expectation:

When the Corn is ſprung up about a foot above the Ground, theſe ſorts of Soil, whoſe nature it is to produce Weeds, will require your Induſtry, and they muſt be taken out, if Thiſtles, or ſuch as are great and offenſive, with Hooks, or Nippers, by cutting them off cloſe by the Roots, or rather pulling them up by the Roots, if that, by breaking the Ground, will not drag up the Roots of the Corn with them. The Nipper may be made with two long Pieces of hard Wood, riveted, to be opened like a Pair of Pincers, with Saw-teeth, cloſing into one another, that they may take the ſurer and firmer hold without ſlipping; and theſe may be much hindred in their Growth, by ſowing about two Buſhels of Bay-Salt, to an Acre of Land, as you do your Wheat after the Grain is Sowed; which is alſo of ſo excellent a Nature in barren Lands, that it heats them to a degree, and makes what is Sowed, proſper and multiply manifold. As alſo will, Steeping your Grain in Sea-Water; or being at too great a diſtance, Brine, eſpecially ſo that you Sowe it preſently after.

As for the Sand, you ſand Ground withal; it muſt be Sea-Sand, if poſſible to be gotten; but if the Ground lie ſo Inland, that it cannot be done without vaſt Trouble and

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Cost of Carriage, more than the Advantage may be supposed to recompense, dig up the saltest, loosest Sand, or Earth you can light on, and make that supply its place. The Saltness may be known, by trying it in Water: for a Quantity being steeped there, if it make the Water brackish, you may be assured it is proper for your use; also Wood-Ashes, Sea-coal Ashes, and Sute, are extraordinary Manurers of Land, being scattered over them, or ploughed in, so that being wetted, they diffuse their Quality of Heat, to temporize with the Coldness of the Earth, and cherish what is Sowed. But as for Rye, it must not be wetted, for among all Grain it grows best with the least wet, and will, as the Country say, drown in the Hopper in a Rainy Day, yet where Salt, Ashes, Sute, or Sea-Sand, have been sprinkled and ploughed in, it will prosper very well on barren Ground so Manured; whereon you may Sowe Barley, Oats, Beans, Peas, Lupins, Fetches, &c.

As for Wheat, the wetter it's sowed, the more firmly it sticks in the Earth, takes Root and prospers.

CHAP. VIII.

To Dress and Manure barren Ground, over-run with Gosse, Broom, Furs, Weeds, &c. relating to Ground dry and wet.

HAving given some Insight into the Improvement of barren Ground, a thing exceeding necessary to be known in a great many parts of this Kingdom, I shall proceed in it to the other Particulars, and especially to the Filling and Dressing rough and barren Clays, encumbered or over-run with Gosse, Broom, and such-like things, of Nature's Product, which hinders Land, by keeping it lean and out of Heart, from being easily brought to produce any thing else.

Now

Now I muſt ſuppoſe theſe kinds of Clayey Ground, whether ſimple or mixed, to lie a little lower than thoſe before diſcourſed on, not ſo ſubject to heat, to burn up what grows on them in the ſcorching Summer, nor to nipping Froſts, to wither and blaſt in the Extremities of Winter; yet theſe Grounds, as they are, will neither properly bear Corn nor Graſs. There is another ſort of Ground, not differing in barrenneſs to this, *viz.* ſuch as are infected with noyſome Weeds, which cauſe Diſeaſes in the Cattel feeding there, as likewiſe thick and overgrown with Broom; for altho' theſe for Fuel, Thatching or Covering of Out-Houſes, *&c.* may be ſome advantage to the Huſbandman, it makes nothing near a Recompence for the loſs of ſo much Ground, as may be turned by a little Coſt and Labour to good Improvement.

To deſtroy theſe Incumbrances, cut them as near as poſſible may be, to the Ground, then make them up in Bundles as big as Bavins, dry them firſt in the Sun, and then carry them home, and Stack them in a place where the Wet cannot fall upon them: for if it do, it will ſoon rot them; then ſtub up all the Roots you can find in the Ground, and lay them in little heaps to dry, after which they will become good Fuel; or burnt upon the Land, and the Aſhes ſcattered, will much ſtrengthen it, when ſoaked in by the Rain, or ploughed in the proper time; for this is about the latter end of *April*, and beginning of *May*.

Thus having thoroughly cleared the Ground, take the Refuſe, with ſome Roots well dried, and pile them hollow, [illegible] of Turfs and Earth, and pile on them, leaving only a Vent, and then give Fire with Straw or Stubble, and the Earth keeping in the Smoak, and receiving it, will, as it were, burn with the Roots, and receive the Fatneſs, and be very mellow. This, in ſome Countries, is called burning of Bail; and when it is well burnt and cooled, with Shovels and Beetles break and diſperſe it over the Land, and it will be a very good Dung, or Manure; then with a very long Plough, breaking up the Ground, and by broad deep Furrows, lay it into Lands as large as you think the Nature of it will bear, higher or

ſtarer,

flatter, according to the like convenience, as it lies more or less subject to the Water, or overflowing of Neighbouring Brooks, Rivers, or great Ditches, or Waters occasioned from Showers descending from Hills, or higher Grounds: for these Inundations greatly hinder Fruitfulness, by chilling, or rotting the Corn, or other Grain, in the Ground, when sowed; so that if it spring up, it comes to no advantage.

But first of those Grounds that lie not within the Danger of Overflowings, by reason of their height, and so of the rest in their Order. But to the purpose: The Ball burnt, cast abroad, and the Land broke up, then, if you can come by it, Salt it with Sea-Sand, after Lime it, as has been directed; or for want of Sea-Sand, scatter as you do Grain, Bay-Salt, mixed with other Sand; or fine fat Earth, well sifted from Stones and Rubbish. Then Manure it with such Dung as you have that may be proper to it, to give it a fertilizing Heat, as that of the Horse, Ox, or Kine, rotten Straw, Mud out of Ditches or Ponds that is fat and slimy, the Sweepings of the House, Flowers, Hills, Barns, Yards, where Cattle crample much; and if you be near the Sea, there is an excellent Weed, called *Wrack-weed*, bearing broad Leaves, black, with great Heads, and twilled like Pease-straw, growing in great abundance among the Sea-Sedge, on many Coasts; with this, when rotten, you may strew over your Ground already ploughed, and plough it in with the rest of the Manure, and by rotting there, it will add heat and strength to the Land. Let this Ploughing be deeper than the first, with larger Furrows, that the new quick Earth so raised up, may mingle with the Manures Hack, and Harrow it again: then take Pidgeons, and Land-Poultries Dung, (for that of Water-Fowl is naught) and sprinkle over it, allowing, if you have it, two or three Bushels to an Acree, scattering it in as equal a proportion as you can, then sowe your Wheat, or other Corn; and for this sort of Ground, at first Wheat is the most thriving, though it will bear other sorts of Grain, and with care, of a very barren and useless Ground, become useful and very advantagious to the Owner; it must likewise be clotted and slated; and if you

want

want Salt-Sand, or Salt, steep your Wheat in Brine of any Salt, and it will produce a good Crop.

You must take care to Weed it, and gather the Stones before, that will obstruct the Corn from rising, and carry them into the Roads, or dry Ditches, or some Pit proper for them; for these Grounds are generally great Producers of Stones.

If Weeds, which commonly breed in wet barren Grounds, grow up to the hindrance of Seeding it, or that you would be at the Labour and Cost to bring it to fruitful Arable Ground, pluck them all up with your Hands, or Nippers of Wood, with Saw-teeth shooting one into another, to hold them the faster; lay them on heaps, dry them, and burn them, then scatter the Ashes on the Land, as before directed. Plough the Ground, but not so deep as the first, yet turn up the Furrows as deep as possible you can; and if it lie subject to Overflowings, make cross Furrows and Drains into Ditches or Rivers, or low places, that the Water may descend, and be carried off as much as may be; if there be no Current, make a Pond at the lower end of it, which may receive the Water; but this will do but little, if it be much subject to Water-flowings, or Marish Springs, and therefore if you would use it for Corn-Land, you must find a way to carry off the Water, or it will not avail your Labour and Cost in Manuring; Directions for which I shall have occasion to Treat of hereafter at large. As for the Manuring, it must be as the former, and so all the Particulars in Management, only you must at the Second Ploughing do it very deep, to hollow the Ground, that the Water may the better soak away, and lay the Lands in Ridges as high as you can, and the Furrows as deep.

CHAP.

CHAP. IX.

To Improve Barren Clay, Simple, or Compound, over-run with Whinnes, with the particular Ordering of it.

THere is another barren Clay, no matter which, either Simple or Compound, that is pestered and over-run with Whinnes, a short bushy, knotty, prickly thing, not growing above a handful from the Ground, yet entangling in one another, and spreading so fast, that they choak the Grass, and obstruct the Cattel from feeding, and the Grass kept thus down, will mostly die, and a mossy Scurf cover the Surface of the Earth: yet for this dangerous Incumberance there is a Remedy, and this Ground I shall instruct the honest Farmer, how to bring to bear a good Crop.

To begin this Work, worthy your Cost and Labour, take a fine thin Paring-Shovel, made of good tough Iron, and well heeled and hardned round about the Edge, and with it pare up the upper Swarth of the Ground, about an Inch and a half, or two Inches deep, turn up every Paring about three Foot in length, and as broad as the Shovel will conveniently do it, turn the Whinns, or Grassy side downward, and let it lie in the Sun two or three days, in dry May, for this Undertaking, is the proper Month, and being well dried on the Earthy side, turn it, and let that well dry, then gather it into heaps, and twist it as it were into Bands, or Cords, and lay it up round and hollow, that fire being put under the hollowness, may easily come at it to consume it, thrusting in to the great Cavity, which must be like an Oven, but much less combustible dry Matter for that purpose.

When these heaps are burnt, break them as Ball with Shovels and Beetles, so that the Earth may mix with the Ashes, then spread them on the Ground to an equal thick-

ses, whilst they are hot and glowing, which will heat the Earth, and destroy the Fibres of the Roots that remain either of the Whinnes, or Weeds.

This being done, plough up the Ground in good long Furrows, hack it small with Hacking-Hoes, Manure it, and further order in all Particulars, as in the foregoing Directions for Gosh, Furs, &c. Let the last Ploughing be very deep, especially your Furrows, and let your Harrows have Weights on them, to press the harder on the Ground, and turn up the remaining Roots of the Whinnes, which being dragged off dry, and burnt as the former, scattering the Ashes on the Land; and if the Harrow will not carry them to the Lands end, have some Boys or Girls to follow the Motion of it, and pick them up as they scatter, laying them on heaps in the Furrows, and when dry, bring them on the Ridges of the Land, and burn them; then sowe your Corn mixed with Salt and Wood-ashes; and this Ground thus prepared will bear good Wheat in abundance, in the space of two or three Years, then sowe Barley and Pease, and Beans a Year after the Oats; and lastly, it will be very good Meadow-Ground, or Pasture, for the space of three or four Years after, and then you must manure it again with a sufficient quantity of Soyl, and it will continue good Ground.

CHAP. X.

To Dress and Manure all Barren Clays, Simple or Compound, Incumbred or Overgrown with Heath or Ling.

TO bring this sort of Ground to bear tolerable Corn, or Grass, far exceeding the Charge, and what it could other ways do without it, you must with Scitches, or sharp Hooks, but old Scythes are the best; cut down the Heath, or Ling, as close as you can, about the beginning of *May*, and let it lie on the Ground to dry, then spread

spread it over the Ground, and scatter dry Straw on it and by setting it on Fire at the several Corners of the Field, in a moderate breathing Air, the Fires will encroach to one another, and meet in the Center, so scorching the Ground, it will kill the Weeds and Roots in a great measure, and the Ashes manure the Ground, then with a strong Plough, having broad Wings, Share, and an even Coulter, laying the Lands large, and the Furrows deep, but as yet troubling your selves to pick out the quick Roots, but let them lie in the Furrows, yet back the Ground over, as has been often directed; and in the sale, with your Hacks and Paring-shovels, when the Ground is dried, pare the Furrows, and where you find many Fibres of Roots, and lay the Parings to dry, then place them in little heaps near each other, in Rows, that is being hollowed up, and dried Heath put under them, they may burn Earth and all, which being full of String and Roots, will do as even to Ashes; and this being spread is exceeding profitable for the Ground, and being plough'd in at the Second Ploughing, it kills the remaining Roots both of the Heath or Ling, and Weeds, if the Ground produce any, having Dunged, Limed, and Sanded it before.

When the Ground is thus Made and Manured, and the Wheat-Seed-time draws on, at the latter end of *September*, or beginning of *October*, plough very deep at the Second Ploughing, even more than ever, so that there may be nothing of the first Furrows remaining, but the Ashes that are turned up, which being covered with Sand, Lime or Manure, the Earth will be very plain and level, so that there is a necessity of raising up new Furrows, and of new Hacking and Harrowing, which sending the Earth light, and a well mixing of all together, so that it may be capable of bearing very good Wheat, especially if Sheep have been Folded on it before, and Dunged well, which together with the Dung of Poultry, is an excellent [illegible]

As for the Weeding and Cleansing the Ground when the Corn is sprung up, you must take great diligence; [illegible] this kind of Soyl, Cockle, Darnel, and [illegible]

Phil[illegible]

Thistle grow not, yet hard and rough Weeds will spring up, of the worst kind; as, Twitchcorrick growing at both ends, Ling, Wild-Time, &c. pull these up by the Roots with your Nippers, as soon as they are pretty well peeped out of the Ground, so as to be discerned and layed fast hold on; for if they grow up to any height and bigness, in pulling them up much of the Roots of the Grain that grows about them will also come with them. As for other tender Weeds, if there be any, you may cut them off with your Hook; and if fine soft Grass grow up, you need not meddle with it, for it will keep the Corn warm, and nourish the Roots of it.

Now for the Profit of the Ground thus ordered: It is proper to bear Wheat plentifully for the three first Years, and the fourth good Barley, with the help of Sheep being folded on it, or a Manure of Poultrey or Pigeon's Dung; and for three Years after very good Oats, and still Pease the eight Year. As for Beans, this Soil will hardly bear them at all; and to the eleventh Year it will prove good Meadow Land, though the Grass will be somewhat course, yet good wholsom feeding Grass as can reasonably expected; nay, it will likewise fatten Cattel, tho' in this latter, a longer time is required than when they are put into Moor Grass, where the Ground is mellow, and of a good natural Soil.

CHAP. XI.

Of Dressing, Ordering, Tilling, and Manuring Barren Sandy Ground, producing only short Mossie Grass.

HAving discoursed, as I hope, to the Reader's Satisfaction, concerning barren Clay-Grounds; the next thing, as I conceive, to be treated of is a [illegible] Method, is the Improvement of barren Sandy Ground, a great deal of that kind, as well as the other, lying [illegible] may want in *England*, *Scotland*, and *Ireland*.

This kind of Ground is usually simple without mixture; and though the Colours of the Sands may change, they are mostly the same, and very little to be distinguished in their Quality. There is a naughty barren cold Sand, lying on high, rocky, or stony places, or upon bleak Plains, exposed to the North and North-East Winds; or bordering on the Sea, bringing forth nothing but an unprofitable short mossie Grass, made bitter by the Sun; and when the cold Dews fall, it is of an unsavoury taste.

Now to improve this Ground to much Advantage; at the Advance of the Spring, with a strong Plough answerable to the Soil, yet somewhat less in the Iron-work and Timber than is necessary for Clay Ground; Plough up of an indifferent Depth, yet not so deep as the Clay; lay your Furrows flat and close to one another, ploughing it very clean, and leaving no Balks; but not so close but you may lay the green Swarth to the Back of the ploughed Earth; or rather, turn one Swarth against another, so that the Furrows may lie, and only but touch the Edges one of another: When this is done, hack it into several pieces, and let it lie for many Days in the Furrows, that the green Swarths beating one another may rot, which you may perceive they are about to do when they grow black. Though these sandy Grounds being easily crumbled, require not the Labour of the former; and therefore the main of the Hacking in this case is to cut the Swarth that it may rot; and it is only required in barren Sands, which have some toughness in them, and not in those that are very loose and fruitful.

When you have thus ordered your Ground, there is way to be used contrary to the former, which is to Marle it. And now because this is a very hard Term to some and not every-where in use, because not to be had, I shall declare what *Marle* is, before I proceed further.

This Marl is a certain rich fine Clay, or Earthy substance, Weeds that spring up of themselves; and gives generative Virtue to all Seeds that are sown in the Ground. It is of a glewy Substance, and not fat as only, as some [illegible] it is [illegible] cold and dry, and very Earthy

fore it came to be Marle; and being made Marle, it is no more but a Clay Ground: As for this, when it is a little hardned, it is only dissolved by Frosts, and this is the reason it always worketh better Effects the second Year than the first.

As for the Colours of the Marle, they are differences, a White, a Ruffet, a Grey, a Yellow, and a Black; and some other Colours, yet all these may be reconciled; for the Colours may alter according to the strength of the Sun, and the Climate they are produced under.

This is so good a Manure, that well layed on it will enrich the barrenest of the Grounds for Ten Years, and some for Thirty. To find it, take an Auger-Wimble, made to hold many Rims, one longer than another, to wring them into the Ground, till you have tryed by drawing the Earth in one place, then proceed in the most likely places, till you come to the Marle: And the most proper places to make this Essay is, in the lowest part of high Countries, near Brooks and Lakes; and in the high parts of Low Countries, upon the Knowls of little Hills, and in the Clefts of steep Banks, or Breaches in Hills, opening of themselves; in some places it lies deep, in some again shallow; and commonly these barren sandy Grounds are verged with it lying very deep.

Having found it, dig it up in great Lumps, and bring it to your Land with what speed you can, lay it on Heaps a yard Distance one from another, and when it is dryed, spread all the Heaps, and mix the Marle with the Sand, and observe, if the Land ascend upon a Hill, to lay twice as much on the upper part as on the lower, because the rain washing it, will carry the strength downward, for that it will fatten the Earth as it goes: and where Marle is wanting, Fullers Earth is an excellent soil to supply the place of it; beat these with a Beetle or Maul, as small as you can; and for this sort of barren Land, though in clay it is nought, you may use Chalk or Lime-stones, which much comforts it, strengthen and knit the Ground together. And having thus done, when Seed-time comes, plough it again deep, that the new-broke-up Earth may mix with the old, and lime it a little; for the Nature

of the Ground requires not so much of that as the Clay Ground.

This Ground will bear Wheat well, but is most addicted to Rye, which will grow on it in abundance. If you sow Wheat, steep it in Salt-Water; and for the other, mix a little Bay-Salt with it when you sow it. The Weeds this kind of Ground is most subject to, are Wild Barbootes, Chessbeks, Gipsie-Flowers, and the like, which may be taken out by drawing up the Roots, or cutting off the Stalks close by the Ground.

The Ground thus ordered will bear Wheat or Rye three Years, and after that Barley with once ploughing, the fifth Year Oats, the sixth and seventh excellent Lupines, and then it will be good Pasture three or four years, after which you must dress it as before, to recover its Heat and Strength.

CHAP. XII.

Of Ordering and Dressing Barren Sand over-run with Heath, Fearn, Bracken; and the Nature of the Soil, &c.

THis sort of Ground is more dry, loose, and hot than the former; and to bring it to Fertility, mow down the incumbring Weeds as close as may be; and if they be high, it shews the Ground of good strength; but if low, weak and out of heart: Lay them thin, and turn the Weeds you mow down, that they may dry; and when they rustle, that you may crumble them, bring your Plough, and turn up your Furrow, that may lie flat to the Ground one green Swarth upon another; then observe how broad your Furrow is turned up, or the Ground so covered, and leave so much Ground unploughed between Furrow and Furrow, so that there may be a green Baulk and a Furrow: And having gone over the Land in this manner, take a Part

Show

Shovel, and pare up the Furrows about two Inches thick, in pieces of three-Foot in length; make them in little hollow Hills, about a Yard and a half distance one from another, till they are dried well in the Sun or Wind, and placing the Earthy part upwards, put dried Fern under them, and fet them on fire; when that is done, and the Earthy part sufficiently parched, lay over the Furrows that are turned up, then beat and spread the Ashes and burnt Clumpers over the Ground, mixing it well with the Mould, then Marle it plentifully; which done, plough it over again very well, leaving nothing unturned up; and then the fresh Ground mixing with the rest, will augment to the strength of the Soil; and this Ploughing should properly be about the latter end of *June*.

The Ground thus dressed, Lime it a little; and this liming will much abate the growth of Weeds, or any other Incumbrance, its acute quality deading the Roots; and above all, is a great Enemy to Thistles, which Fern-Ground naturally alters into: After this, it requires a third ploughing very deep, and harrow it well; but my advice is not for sowing Wheat on this sort of Ground, it not being proper for it, unless a little on the best part of it for the Supply of your Family, because it has not much more Strength than the Manure allows it; but it will bear excellent Rye the first three Years, and the fourth Barley; and three Years after tolerable good Oats; the eighth Year you may sow Fetches or Lupins; and for three Years after it will be tolerable good Grass, with a little Manure, of Dung or slimy fat Casting of Ditches or Ponds. You must after sowing harrow it well, and close it; for though it is Sand, the Marle and Lime will make it cling hard together.

The Weeds that after this are most likely to spring up with the Corn, are, Fern and Thistle, where the Lime had not strength to settle and destroy them. As soon as they appear, pull them up, and lay them on heaps to rot and make Dung.

CHAP. XIII.

Of Ordering and Enriching Barren Lands, subject to Wild Briars, Twitches, and Bushes, &c.

THese Lands remaining in their Nature unprofitable, Art and Industry are required to render them advantagious to the Owners; and in the first place, cut up these Shrubs, or Under woods, as close to the Ground as may be; then stub up the Roots very clean, and they will in a manner recompense the Labour, in serving for Fewel, or mending Hedges; then with a pair of strong Harrows go over the Ground, and laying Weights on them to press the harder on the Surface, rake up the Twitch Briars that have escaped your sight, as also the rough Grass, till the bare Earth appear, unloading the Harrow as they are clogged, and laying the Refuse up in Heaps on the sides of the Ground to dry; and then bring them on the Ground and burn them, spread the Ashes, and plough them in, leaving no part of the Ashes untouched with your Plough; hack it small, and let it be run over by Children, or others, at a small rate, to gather up all the remaining Fibres or Roots that appear above ground, burn them also, and scatter the Ashes on the Land.

To manure this sort of Ground: The best Manure, Experience approves of, is Horse or Ox-dung, Straw rotted in Stables of Cow-houses, with the Scowring of the Yard where Sinks come, and Cattel or Poultrey tramp'e, and likewise the scowring of muddy Ditches, Ponds, Brooks, Lakes, where there is far Slime, which is known by Willows growing and thriving about them; manure it with the first Manure, then harrow it over and sow it; after that harrow it again well, and it will produce exceeding rich Muslin, or Mixture of one part Wheat and two of Rye; for then the Crop will be

more

more certain, and thrive the better, and this will hold for three Years; then sow Barley, after that Oats, and so go on, as in the precedent Chapter.

As for Weeding, you must do it as soon as you perceive the Weeds sprout up, pulling them up by the roots, or they will be subject to grow again.

CHAP. XIV.

Of Ordering, Tilling, and Enriching Barren Lands, encumbered with Moors, or Moorish long Grass, &c.

AS for this kind of Barren Land, it is the worst, being moorish, blackish, with an ill Sent, bearing rushie long Grass, or Moss and Grass together, which the Beast, though hungry and hard fed, will meddle with; and these kind of Grounds are commonly full of Moors, and boggy Wetness, in some places growing Moss and Grass, in others Rushes; which last is the best kind of Ground to manure, and are generally extreamly moist and cold; and therefore when you enter upon manuring it, it must be drained, by making Gutters into Ditches, Brooks, or some Neighbouring River, with Sluces to let out the Water that is in, and keep out the Overflowings; which I shall more amply speak of, when I write of, treat of Draining Fenns and Marshes, Boggy Grounds, &c.

The Land being brought to a considerable Dryness, plough it up with a very strong Plough that may go very deep, laying before the Plough Reeds of Fetches, Peasestraw, or that of Lupins; turn the Furrows of Earth upon the Straw, that they may be smuthered under the Mold; and to that every Furrow, or most of them, and give them time to rot the Straw; and if Rain fall not to rot it, drain the Sluces, that the Springs may overflow it,

and then presently drain off again; then hack the Ground into small pieces, strew Lime upon it, and other Manure; and if you have any Sea-sand, sprinkle it likewise over it; then marle it, and lay on a small quantity of Chalk; and about the latter end of June make the second ploughing deeper than the first, that if any of the Straw remains unrotted, it may by the new acquirement of moist Earth the more speedily putrifie, break the Clots, and lay the Land even, without Clumpers or Weeds, or other Annoyance, and let it so continue till October; then plough it the third time, hack it, and sow it with the best Seed-Wheat; and though in itself it is the worst of Ground, yet by the help of the Soil and Compost with the Weeds that you may let in at pleasure, it will produce good Wheat for three Years, then sow it with Barley the next Year, helping it a little by Folding Sheep on it, and for two Years after it will bear Rye, and the nine Years Oats and Peafe; then for three Years following it will be good Meadow and Pasture; after which time it must be ditched, and put in Heart as before. But for the Inconvenience, the Corn will be subject to, will be small Weed and Sedg, which you may weed out soon as you see them well appear, either pulling them up with your wooden Nippers, or cutting them close with your Weed-hook, and they will not grow again.

CHAP. XV.

A Way in General to Enrich any sour Sand or Clay for Grain, with less Trouble and Cost than before.

THere are divers things that some, through Ignorance, [illegible] manuring and enriching of Land; of these a Sack full and a half [illegible] Acre of Arable Ground, being spread or [illegible]

small, and spread in equal thickness over the Land before Fallowing-time; and then coming to fallow, let the Plough take them carefully into the Ground, and cover them; after this use Stirring, Rolling, Ridging, according to the Rule of good Husbandry in their proper Seasons.

When you come to Sow the Land thus ordered, to make the Seed prosper the better, steep it in thick slimy Water that drains from Dunghils; and if no such be to be had near-hand, steep Cow-dung in Water, and soak the Seed in it. Wheat will be well soaked in 18 Hours, Barley in 36, Pease in 12; Rye and Oats may be sowed dry, for they receive more Hurt than Advantage by wet; cover and order it as has been directed in other Cases, and fear not an extraordinary Encrease.

The Shavings or Waste of Horn, or the Hoofs of Beasts, are extraordinary good to dress Land withal; scatter the shaving to the like quantity as the Rags, and plough them in after the same manner; and these Manures will give a good Heart to the Ground for the space of five Years without any renewing.

The Hoofs of Cattle are approved for this, and may be got of Trotter-men and Tripe-men, &c. and these must be sliced, or cut small, and strewed on the Land as the Rags. Soap-ashes, when the Lye has been drained from them, is of excellent use to strengthen Land; beside the Advantage it has of killing Weeds and Insects that breed in the Ground, and eat up the Corn, being dried, beaten, and lightly scattered over.

The Fat of Beasts enriches Land, being strewed and ploughed in, and there let lie to rot. Also Mault-dust is much available, or the Excrements of Mault, allowing three Quarters of it to an Acre; and to enrich your Dung on the Lay-stall, is to throw often Beef-broth and other vast Broths upon it, as also Soap-suds; and in so doing one Load will be worth three of the same kind that is not so used: If you continue it long, the Blood and Garbage of Creatures much fatten Dung, and makes it of excellent use; and so does the Dregs of Oil, or the Trellings or Grates of the Whale, or any other Sea-fish;

So that by what I have discoursed, much greater Improvements might be made than is as yet seen.

If you would enrich Barren Woody Land newly stubbed for Enterale of Corn, take the Underwoods or Sprays, place them in a great hollow Heap, and cover them with the Turfs or Swarths you pare up, Earth and all; then put Fire to the Wood till all be well burnt, break the Earth, and spread it over the Ground, mingled with the Ashes of the Wood; spread it a second time with the Ashes of Fern, Stubble, Straw, or the like, and let it rest a while, plough it, and soil it at the beginning of October, and ploughing it a second time, sow it with Rye the first Crop, and it will bear it very plentifully; the next may be Wheat, the third Barley, the fourth Lupins or any other Pulse, and then proceed to sow it with Wheat again, and this Land will last in good Heart for eight or nine Years, and longer, where there is any natural Fertility in the Soil, as I have to good advantage been experienced in many woody parts of England.

CHAP. XVI.

To reclaim Grounds for Pasturage that have been spoiled by Salt-Water, or Overflowings of Sea-Breaches.

This is a very difficult Point; for though Salt-water or Salt-sand moderately used on Ground, gives it new and Vigour, yet Excess subjugates and wholly destroys the Strength of it, eating and spoiling the Roots of Grass, Trees, or any thing of natural Growth; and to excuse the Salt-water being drawn off, and strayed from any more flowing in the Ground by lying low, is capable of having fresh Water brought upon it from higher places, which lying sometime, will take out the Salt of the Earth the other left behind it to a great degree; it need not exceed above four or six Inches on the Sur-

face,

bad; if the Land be level, let it lie two or three days, and then by the help of Ditches or Sluces drain it away, or by the help of Engins, which I shall have particular occasion to speak of; it may be thrown off into convenient places, as over the Banks into the Sea, if it be near; or on other waste Ground, where it may dry up; and between whiles flow it often, till the fresh Water has in a great measure taken the Saltness out of the Earth.

The Ground being drained and pretty dry, about the latter end of March plough it up as deep as well you can, and up in large Furrow, and laying it into Lands, raise them up as much as you can, lay them round, and obserue if they be stiffe or mixed; if it be Sand, whether red or brown; then take such clear Earth as is free from the Washings of the Salt Water, being of a small and more Stiffness and Richness, digged out of some Pits or Banks where the Lean Mud or Spoil may be made; lay it in like manner, and spread it over the Land; and when dry, plow it, and break it as finely as possible; and the Earth will suck and draw the Salt into it, taking off much of the evil quality in the sandy Ground, and also allaying the Sand, makes it apt for Fruitfulness.

If the Ground damaged by Salt Water be rough, hard, or stiff Earth, then spread in like manner the best and richest Clay that can be had, or for want of that blue stiff Marle, which will not only suck up the Saltness, but cool and mend the Ground, adding new Nourishment, whereby the Seed that is cast in will be fed and nourished. But if the spoiled Earth be a rough stiff Clay, though seldom found so near the Overflowings of Salt Water, cover it over with the finest fresh Sand, which will separate the Sand from the Clay, and take away the naughty Stiffness of it, that will otherwise oppose the rising of the tender Sprouts; it will also give a gentle Warmth, and abate the Coldness of the Clay, and make it bring forth plentifully.

If it be a mixed Earth, observe whether it be binding or loose; if the former, Sand it as before; if the latter, spread it with the richest Clay you can get: When you have thus ordered your Land, plough it a second time before

before Midſummer, ſo that the ſame Earth may be well mixed with the old; ſome ſay the Mud of the bottoms of Lakes, Ponds, or Ditches, or Waters that were freſh, or Woollen Rags chopped ſmall, or with both together; cover it over lightly, then immediately plough it Land after Land, left by long lying the Sun attracts the ſtrength out of the Manure, then lay it out till *Michaelmas*, and ſo ſow it, the laſt ploughing, and ſow it with the hardeſt and beſt Wheat, for this ſort of Land, that which is called the [illegible] and if the Salt Water has been [illegible] good Crop; the ſecond Year ſow it with [illegible] Hemp-ſeed, and it will prove very graſſy; the next Year lay it flat for Oats, and then lay it down, and it will prove good Meadow or Paſture: However, the firſt Year after laying down let Sheep graze on it, whoſe dropping it will Dung will fertilize it, and then you may uſe it as you pleaſe; either keep it for Grazing [illegible] and produce extraordinary good Graſs, or for Mowing, and at a few Years you may plough it again to produce good Corn, eſpecially Wheat; for by this time the Saltneſs is very much taken out of it. And thus you may reduce all ſorts of Ground overflowed by Salt Water, where there are no Salt Water Springs to feed and ſtock it; for if there be, and they cannot be drained, turned away, or otherwiſe remedied, your Labour is loſt. Where freſh Water cannot be brought to the ſame Grounds as ſome there are, add to your former Manure Moorish Earth, the Soil of Sheep and High-ways, the Earth dug up where Dunghils have lain a conſiderable time, Rubbiſh and Sweepings of the Houſe, Barns or Yards; and having ſpread them on the Land, take a large Hawthorn-buſh, rough and prickly, platt cross-ways and faſten to it. To make it lie flat and preſſing on the Ground, tye on the upper part of it wooden Rowlers, and lay other Weights on it, to faſten it to the Horſes Drawing-geer by the Stem or great Stalk, and draw it over the Ground in the manner of a Harrow, to break all the Clumpers, and lay the Earth very ſmooth after every ploughing; then ſprinkle Soap-aſhes moderately on it, and it will loſe its Saltneſs in a little time,

and

and become good producing Grounds, either of Corn, Meadow, or Pasture.

CHAP. XVII.

Good Pasture and Meadow to be made of Barren Soil, of any sort of Earth, simple or mixed.

WAys of enriching the Earth are two-fold, *viz.* By Water and Manure; and for this use the lower the Ground lies, so it be subject to Overflowings or much Wet, 'tis the better, and is sooner made good, and brought to Pasture. Then consider what sort of Grass is naturally produced, whether clean and entire, or mixed with that of worse growth; and of these the first is most promising; and if the Growth be interlaced with Thistle, Broom, or the like, or burthened with offensive Weeds; grub and pluck them up by the Roots, clearing the Ground of them as well as you can; dry them, mix them with Straw, and burn them upon the worth of the Ground, and spread the Ashes; then fold your Sheep upon the Ground for several Nights, that their Dung may strengthen it, and their Feet trample up the Grass; then scatter it over with good Hay-Seeds, and go over them with a Rowler, or beat them with a flat Shovel, that they may be the better pressed into the Ground to take Root; then over these scatter Hay, or the Rotting of Hay under the Stacks, or the Sweepings of the Barn, or moist Bottoms of any Hay that has been good, and is mouldy, and of no other use; these spread on your Ground, and by no means suffer Man's Ordure, or the Dung of any Beast; and being thinned, and the Clots well broken, let it lie till the new Grass springs through it; and the first Year do not graze it, lest, not having taken very good Root, the Cattle pull it up, but mow it while it comes to perfection. And although the first Year it may prove short and coarse, yet the second it will be fine and

very

very long, and in some Places, Experience in Twenty or more, Years Dreſſing, will continue it for good Meadow or Paſture, If in any Seaſon you have Water to relieve it, which may be gathered by bringing Springs, or the violent Fallings of Rains, into a Ditch, on the other ſide of it; or by any other Convenience, according to the Situation of the Ground on the aſcending part, to overflow it ſo long, that it ſoak deeper than the Roots of the Graſs, to continue Moiſture for the Nourriſhment of it a conſiderable time.

The beſt Seaſon in general for watering Meadows, is from the beginning of *November* to the end of *April*; and the muddier or more troubled the Water is, the better, for then it brings a Soil upon the Ground, and this is eſpecially after haſty Showers, and great Floods of Rains; and your main Concern, if your have many Fields lying [illegible] is in a Defence to pen up the Water [illegible] and then by a Sluice or Paſſage of Ditch [illegible] and by a [illegible] of Water tranſmit it to many [illegible] if you Graze the Land, it may be done at [illegible]

CHAP. XVIII.

Several Uſeful Rules deſcribed for the Watering of Meadow, Paſture, &c.

[illegible]

The

The *Persian Wheel*, so named from its use, and the great Advantage it brings to the Kingdom of *Persia* on this occasion. This Wheel is made after the manner of an Undershot Mill, viz. with a double Ring, into which two Pins pass, and on them the Floats are fastned, which Floats are to be hollow, and the half most remote from the Wheel holds the Water taken in at the open place about the middle of the back of the Float, and as the Wheel turns, so the Water is raised by degrees, and bends towards the part of the Float that is next to the Wheel; and as it surmounts the Receiver, the Water empties into it, one Float succeeding the other; so that at one turning round of the Wheel 30 Gallons of Water may be delivered. This Wheel ought to be about 14 Foot Diameter, and the Floats at 18 Inches distance, and so it will deliver the Water at about 10, 11, or 12 Foot above the Stream it takes it from, and may be carried four times round in a Minute; So that in one Hour it will deliver about 120 Hogsheads of Water, with 12 or 18 Inches penning or stopping; but an ordinary Current of Water will very well water about 30 or 40 Acres of Land, according as it may lie disposed to receive as to Level or Declent.

When you do this, consider the Nature of your Land: If it be a cold Clay, too much Water injures it; if light, warm, or sandy, then a little Water greatly refreshes it. It is also to be observed, that this Motion will let a going is constant, and will last some Years with little Charge of Repairing; and the slower it moves, the better it delivers the Water, and a small Stream will carry it. It may also be used in Draining of Lands, if a Current can be made to carry the Wheel about; and as the Land lies higher or lower, so lesser or greater Wheels may be used; and they will exceedingly superabound the Charge and Trouble, by making of Grass grow in great Plenty, where otherwise little or none would appear; and by Troughs or Trenches the Water may be carried from one Ground to another a very great Distance, if not hindred by steep Ascents.

There

There is another sort of an Engine used, which is called a Wind Engine, and may be used on hill Waters, where there is no Current to carry the Wheel about, or a Dam cannot be conveniently made to force it; and this serves indifferently for watering or drawing. Several have been the Inventions of Ingenious Men to accomplish this; some have designed it by Horizontal Windmills; and by a Wheel, with Scoops or Buckets fixed to Chains; also by a Wheel carrying up the Water in Buckets fixed thereto, and by the Swiftness of the Motion casting it a great way forcibly from it. But that I most approve on, as the best and least chargeable, is the Vertical Sails, like the ordinary Windmills, only they are not so long, though more in number, placed on an Axis of a length proportionable to the length of the Pump, the one end resting on the above-said hollow piece of Timber that is to move round over the Pump, as you have occasion to turn the Arms, the other resting on a Semicircle, in which there are several Notches and Stays, that it may be placed as you please: So let the Wind stand any way, yet by the Motion of the Semicircle you may have it at one end of the Vessel or the other; and let the Pump on which the one end of the Axis rests, be placed over the place you are to draw your Water out of, at the Mouth, or Mouth, at such a height as is convenient to convey it into a Trough; and this Pump may be made of a Diameter, according to the strength of the Windmill; and observe to order the Buckets, that it may always dip into the Level of the Water, which prevents much Injury and Trouble to the Work. This Pump may be round or square, according to the smallness or largeness of it. Let the Handles of the Pump extend in length to the Axis of the Windmill, which must to receive and move them, be made crooked, like the Axis of a Cutler's Grinding-Stone, or Dutch Spinning-wheel turned with the Foot; or the end of the Axis of the Windmill may rest upon a Cylinder or Box made moveable on the top of the Pump, with the crooked Neck or End within the Cylinder; so that when it is turned any way, the end of the Axis is perpendicular over the Pump. And, moreover, you must take

take care that the Handle or Rod of your Bucket may turn Swivel-wise, to answer the Shiftings of the Wind as the Sails are changed; and these kind of Mills are of excellent use, and to be made or manured at a small rate, and are eafily to be repaired when out of order, or taken to pieces and removed from one place to another, carrying off abundance of Water, if kept in continual Motion, which a scanty Wind will do.

CHAP. XIX.

Further Rules and Directions for Watering Meadow and Pasture, for the Improving and fertilizing of it.

HAving spoken of conveying Water to the Ground, I come to direct how it ought to be dispersed after the Water being raised to the height you desire, cut your main Carriage, allowing it a convenient Descent, that it may have a good Current all along; and let the Mouth of it be of Breadth rather than Depth, capable to receive the whole Stream you desire; and when you are to use a part of the Water, let the main Carriage narrow by degrees, that at the end it may press the more forcibly into the lesser Carriages that line all along from it; and as every rising Ground, and other grosser Obstacle, you ought to cut fresh superficial Carriages proportionable to the Distance and Quantity of the Land or Water you design to fructifie, which must be very shallow, and many in number; for the Water running shallow and swiftly over the Grass, greatly revives it. In the next place observe, that in drawing or watering of Lands you may make Drains to carry off all the Water, the Carriages being on; and therefore they must bear some Proportion to it, though not so large; and as the Water is conducted by the lesser Carriages to every part of the Land, so the lesser Drains must be made in the lowest

lowest places to lead the Water off, and as the Carriages
decay, so must they widen as they run to drain the Wa-
ter well off, as soon as the Land is well forked into other
Grounds; for if Water be left in low places, it proves
very injurious to the Grass in the Winter, it kills it, and
in the Spring and Summer much hinders its growth,
breeding Rushes and Weeds, though when drained pro-
duces good Pasture.

If you water droughty Land in the Heat of Summer,
do it in the Night, or a very cloudy temperate Day, ta-
king it off again before the Sun-beams shine hot upon it,
left that conspiring with the Heat that comes out of the
Earth, deaden or scorch the Roots of the Grass, so as
Winter and Frost rather than grow to any great Advan-
tage.

In some places, for the more ease of Watering, you may
have the opportunity to command a small Stream or
Spring, and to bring it down by Carriages upon the Land,
and proportion them, small or great, according to the
quantity of Water you can give; and if it be little from
shining Springs, make Stops to the Carriages, that it may
rather rise Land high, and then by the Drains convey it to
those which want Water, and by degrees to all, as Con-
veniency will admit; and the small Springs in constant
Watering will bring much Improvement.

As for Springs that produce a hard harsh Water, pro-
ceeding from Alome, Vitriol, and Coal Mines, or Mi-
nerals, it is not to be brought on Lands, unless for the
destroying of Rushes and Weeds, and afterwards the
ameliorating of by mixing Waters, or well dung-
and earth'd Grounds, Soil, to amend the Barren-
ness, and produce store of Grass.

CHAP.

CHAP. XX.

The proper way effectually to Drain Land, and reduct it to Fertility, either Arable or Pasture.

WHen Land is much incumbred by Water, and thereby rendred as it were useless, especially where there is a Superfluity of venomous corrupting Water lying in the Earth, much occasioning Bogginess, you may nevertheless consider, that this Land, with some Labour and Cost, may be brought to be very good; and in order to the procuring of it to be so, I shall lay down plain Rules and Directions:

Take special Care in draining such Grounds, especially where there are feeding Springs; and observe in this case the Descent, that you may the better by the Drain take away all the Water from the bottom, or else it will be of little Value; therefore observe the lowest Level of your Drain, and so low that you may draw off your Water, and not any lower can you carry it away by this means; therefore be especially careful herein, and then if you can get a lower Descent from this, carry your Drain upon the Level, till you find certainly you are got under the Moisture, Miryness and Water, that either feeds the Bogg, or covers the Land, and go a Spade's Graft, or thereabouts, deeper, and so you need not eye your fall to a dead Leavel; but as the Moisture lieth higher, or Ground rises, so may you rise in the working your Drain, keeping one Spades Graft under it.

Observe, that in cold Rushy Lands this kind of Water that creates much Barrenness, is found beneath the first and second Swarth of the Land, and beneath that you most frequently find a little Gravel or Stony-ness, in which this Water is; and sometimes below these, in a hungry Gravel; but it usually lies deeper in boggy Land than in Rushy, and a Spades Graft you must go deeper than

than the bottom of these. As for the Matter causing the Bog, it is easie to be discover'd, sometimes lying within two Foot of the Superficial part of the Ground, and usually within three or four; though some lie far deeper, as five and eight, or more; and having found this Spring that would willingly break out, were it not incumbred by the Load of Earth it is forced to wherein through, and break its way by much spreading, dig a Foot beneath it, give it a Current in the Drain; and if it be swift, it will suck all the other Springs to it, and make the boggy Superficies of the Ground to cease, so that in a little time the Drench will subside.

Make your Drain from the bottom of the Bog, trenching it in the sound Ground, or else in some low Direction as low as you conceive it under the Spring, or Spewing Water; then carry up the Trench into the bog Straight through the middle of it, one Foot under the Spewing-Water or Spring upon the Level, unless it rise higher; for many times it rises as the Land rises, and other times riseth very level, even to the Head of the Bog, into which you must carry your Drain, or within two or three Yards of the Head of it; then at the Head make another Trench overthwart both ways at the middle Trench, as far as the Bog goeth, all along the End of it, continuing at least one Foot under it; and this may work a strange Alteration in the Ground, without any more Trenching.

Or to work it somewhat more certainly, consider after you have brought a Trench to the bottom of the Bog, then cast a Substantial Trench about it, according to the Dimension of the Bog, whether round, square, or long, of three or four Yards within the boggy Ground; for so far it will drain well that which you leave without the Trench, underneath the Spring-Water Round; and when you have so done, make one Work or two overthwart it, upwards and downwards, all under the matter of the Bog, and in a Year or Sooner your Desire will be answered.

CHAP.

CHAP. XXI.

To Drain Fenny and Marshy Lands with the least Charge, and most effectually, &c.

FEnny and Marshy Ground is another thing to be considered, and great Advantages to be raised by well draining them, so that they may be converted to Pasture, Meadow, or Arable Ground; for of this Land a vast deal in the Kingdom lies waste, and turns to no Advantage, unless to a very few, and that inconsiderable; but to do this, it is not only taking away the Water from the Surface, or over part of the Turf or Swarth; for then might all Quagmires and Bogs be easily recovered; nor is it the ling off the Downfalls, as the Fen-men call them; for then that might be easily done, and yet no perfect Draining for continuance; no nor the Land-falls, Land-floods, nor great Waters from off the Ground; nor doing all these in a way of usual customary manner, that may deserve the right and proper Name of Effectual Draining.

You must then to do it go to the bottom of the Cure, if you would perform the Cure, and take away that which is the Source, and feeds the Fen or Moor, making it barren and useless by corrupt and unwholsom Waters; and when that is done, it may be properly said to be a Perfect Draining, and not before; yet the other is not to be discommended nor discouraged, where they are already done, or may be made hereafter; but the Perfection is, in reducing it to Soundness or Perfectness of Mould, that the Wet may not follow the Plough; or it only bearing courle Grass in the Summer, be overflowed in the Winter; but this is well done, whether the Earth is Sand, Clay, Gravel, or mixed Earth, when it returns to a perfect Swarth, pure Turf, producing the small Thistle, Crowflower, Clover and Honeysuckle; then is the Quintessence of the Earth properly prepared; and in

feeding

feeding and corning they will naturally return to be the richeſt of all your Lands, as appears by many already brought to this Perfection lying near Rivers, and under the Level of the Sea; and moſt of the Ground in *Holland* has been improved this way, to a conſiderable enriching of thoſe People by fat Paſtures and good Arable Lands.

But waving ſome Objections that may be made to no purpoſe, by ſuch as are not deſirous ſuch publick Works ſhould go forward, becauſe perhaps they have a Cow, a Horſe, or a few Sheep to feed as Commoners, which can graze ſufficiently about the Edges of theſe overflowed Lands, I ſhall come to the Point, and give an Eſſay of this matter, which, well put in practice, may turn to great Advantage.

Conſider then, that the greater the Overflowing is, the heavier it lies on the Land; and for the paſſing off theſe the Water-cuts and Works muſt be proportionable, and the Labourers in it the more; for this Work muſt be done ſpeedily, a little neglect ſetting it frequently a great way backwards, if the Works be conſiderable; and therefore going about this neceſſary Improvement, raiſe ſuch Banks on the outſides of the Fens, as may keep out the Land-floods coming from higher Grounds and Ditches to carry them away on the outſide into ſome adjacent River or Water-courſe that carries them to the Sea, or ſome convenient River; by which means you may have nothing to do with any thing but the proper Water in the Fens; then conſider how to draw your middle Trench, which is the main, to the beſt Advantage, that the Waters may paſs from others into it.

Take notice of the Advantage of the Ground in all its Particulars, as to its aſcending and deſcending, its Level and Hollow; ſo that having truly caſt every thing well in your Mind, drain the Water off by Trenches or Engines that will caſt it a pretty way in great abundance from the lower parts that lie beneath the Level; alſo by the help of Men, where they are to be had, with Scoups and Buckets.

When

When a Drain is appears on the Surface, and it is Visible, yet there are some Springs, search for them: and when you have found them, do in all respects as by the boggy Ground mentioned in the foregoing Chapter; and as for the smaller Hollows, if they dry not, it matters not greatly; if they have no Springs in them to cause an Overflowing in Winter, for they will serve to Water and bathe your Cattle in the Heat of Summer, or produce a numerous Fry of Fish for storing other Ponds: As likewise keep Game there, to your Advantage, by alluring the Wild-Ducks, Geese, and other Water-Fowl, of which considerable Advantage may be made; but be very careful after this, that your outward Banks break not, to let in the Land-Floods from the Hills or high Grounds.

If the Trenches are necessarily to be many, endangering your Cattle falling into them, you may fill the smallest that come from the Springs, to the greater, with Pebbles and Flint about two Foot, laying them as light as you can, and over them Flags, Rushes, and Turf, and upon them Earth to the Level, and the Water will find a Passage among the Stones as in a Vault.

CHAP. XXII.

Tools and Instruments proper and useful in the working part, and order of Draining Land, &c.

THE first thing necessary is a good Line, about 32 Yards in length, made of the best Water-wrought Hemp, about double the thickness of Whipcord, and a Hand-Reel to wind it on, that you may draw your Works by it as near unto the Streightness of the Line as possible; and by the Length you may measure your Work by the Rod or Pearch, to know how it goes on.

You

You must also have an exact Water-level near, or
together 4 Foot in length; which Instrument many ha
elayed, and made some open, with a Channel for the W
ter to run all along upon a three inch Board, with Sig
true to the Water, placed at each end, each at a
Proportion from the Water to direct the Level; but
lies so open to the Wind, and is so troublesom in re
ving, that I approve not of it: Then make one for
more safe Carriage and true Performance of this W
to fold into another square Staff, about 5 Foot, or 5
a half, made of the best young seasoned Oak, the L
or Barrel 3 Foot and a half, which Barrel in the midst o
is to be planted into the top of the Staff, and so much
the one part of the Staff, and just half the length of
Barrel taken away with a Rabbuting-Plain or Moulding,
both join together, and with these Joints make one e
clear streight Staff and formable, only about a quarter
an inch taper upwards, from the bottom to the top,
it may not be too heavy; and the Sights are to be
into both ends of the Level-Barrel, that so they may
firm and hold Water, and yet become very little
noyance either to Sight or Practice; and in carrying it
is a streight Staff, with a strong Pike in the bottom
to stick into the Ground when they use it not; and
Exercise being unfolded, not much unlike a Survey
Cross-Staff.

The next useful thing in this Work, is a Trenchi
Plough and Coulter, whose particular use is to cut
Trench on both sides with great Expedition. To
this, take a piece of tough Willow Timber, about
bigness of a Spade-staff, somewhat streight, only a
incthes and it must crook a little up, with a Neck li
Foot so run out the Ground, and just above the Neck
be placed a little Coulter, to shear or cut the Ground,
on one side the Trench and then on the other;
where this Coulter is wedged in, the Stake must be p
with Iron to hold it the faster; and having cast
Trench by Line, then use this to cut out the sides of
Trench, which it will do almost as fast as a Man can
dow it, cutting it out to the end by running along

Li

Line; and when one side is done, place it to the other, and do it in the same manner; and this is called the plain Trenching-Plough. But if you would have this done with more exactness, then place in the Foot of the Staff, and in the middle of the Foot, a little Brazen Wheel, about 2 inches high, that the Foot, bearing itself highly on the Wheel, may bear itself with more ease; but this Wheel must be well planted in the Foot, upon Plates, and a little Iron Axle-tree; and these you may use to cut Turf downwards, and Trenches 18 or 20 Inches broad, or such a proportion as is required to carry off the Waters: And this Turf and Earth taken up by a trenching-Spade, will be of good use to Swarth bare Ground, or fill up low Places.

The turning-Spade must be made with a Bitt, looking up twice so much as is requisite for an ordinary Spade, with one thin Shooling also, looking up the Bitt of it, very well steeled, and more broad at the Point, or nether-end of the Bitt, than at the over-end by half an Inch; so that by this means, it will take up Turf all of one thickness, and at a Natural height as a Man stands when he usually covers: and one of the same Form, a little less, may be used with Advantage in cleansing the bottom of Trenches, and are very useful in Banking, and Levelling high Ant-hills.

The trenching Spade, is another Instrument very useful in this great Work, which ought to be between 4 or 5 Inches broad. The Tree must be made more of Compass, and looking up by far than your ordinary Spades; so that you may carry a Trench level in a direct Line, move by the strength of Arm, and guided by the bottom of the Belly. The Spade Shooe must be made with two Sides, or Wings, up from the end of the Bitt, as if two broad Sieve blades were placed on a common Spade, to look forward with their Points from the end of your Spade Bitt, and they must be made a little stronger, yet not above 2 Inches broad; at the very Bitt, as thin as the Work will bear, and narrower and narrower upwards, till it come to be but an Inch, and 5 Inches long, made very true and exact, sharp and smooth, or it will not work forth its Cout, and

Furrow clearly and easily, but exceed the strength of Man to manage it, in making good Work.

This Tool cuts out its Furrow, and Coar so well, that within a Week, if your turn be served, you may lay down again in the same evenness, and it will be no way prejudicial to the Grass; and when it is a little settled, will become of its former evenness with the other Ground.

The paring-Spade is another Tool useful in this Work. The Bitt of this may be made all of Iron, being a strong Plate, having a convenient Socket to put a strong Shaft, or Stale into, that it may be fastened, not easily coming forth again, but when you please: The Bitt must be made six Inches long, the nether-end, and two sides, sharpened; the nether part of the Bitt a little bellied, and squared, and the sides a little compassed, or hollowed; and the sides, and end, as sharp as they can be made, for the proper use of it is, now and then, to cut a Trench in Valleys and low Places, where the trenching Plough either Wheel'd or Plain, cannot conveniently come at, or yet practically to pare off Trenches after the first Tillage, whose Edges will grow so thick with Grass, that the Share, or to its Currency in passing, will be obstructed, or dog it, will break the Trench, and cut it too thick: but with this, as with a cutting Knife, you may take it all along the Trench Line.

The trenching-Gauge is another Instrument, made like a Scoop Shovel, with a sharp Shoot fastened at the end, and a little bending upward; and this is to be used in the trenching-Spade, in a round bottomed Trench.

CHAP. XXIII.

The best way to Improve Drained Fen-Lands to great Advantage, &c.

HAving already given Directions for Draining, and how to procure Materials in order to perfect so necessary a Work; it will be proper now for me to speak something of the Advantages accruing thereby.

As for that which is mostly dry Fen-land, and sometimes but partly under Water, and that not always, I consider it according to the quality of the Soil, to be the best capable of raising present Profit; and if you have enough other Ground for Grazing and Meadow, you may Plough it up, and it will prove excellent Hemp, and Oad-land, produce great Crops of Cole, and Rape-seed, which will indeed, grow on worse Land; so that by a little Marling, Liming, Ashing and Dunging, you may improve it to bear excellent Wheat, Barley, or Rye, ordering it as has been directed for Barren-land, upon the Account of those sorts of Grain.

There is a second sort, subject only to be drowned by the Land Floods, and great Rains, and dry when they are gone, or in a dry Season; this I count worse than the former, and is proper to be Ploughed up, raising it as high as your Drains will carry off the Water: in the Lands 3 Yards over, that will bear two Casts of Seed, changing your Furrows in Ploughing, to stir up the Mould the better, that the Water may soak out of it into the Drain-Furrows; and be careful not to make your last Furrow always in one

As for the Manuring it, let it be with Lime, Chalk, Ashes, not Dungs, as Horse-dung, Cow-dung, or the like; for in the usual Plowing, it will bear excellent Wheat, Oats, Peale, and hold good to for three Years; but over Ploughing this kind of Land, takes the Heart out of it, therefore

I conclude it the most convenient, after three Years Sow-
ing, to lay it down for Meadow or Pasture; or a fourth
Year you may Sow it with Clover, though it will bear
Corn much longer, but not a considerable Crop, till it has
rested two or three Years to recover its Spirits; and when
you lay it down, scatter it lightly over with good Hay-
seeds.

The Third sort of this kind of Land, is that which ly-
eth very low, and deep, and has been long under Water,
before recovered, that it was turned to Turf, or is
very little useful, except two or three Months in the Sum-
mer, and that in a very dry Season, and this, as it is na-
turally, is not good for the feed of Cattle, rendring them
lean, and unsound; therefore when drained, to bring
it to a better State, pare off the Rushes, and rough Sods
the Roots, Stumps and all, and lay them a drying, com-
monly hollowed about the beginning of May; so that when
it is turned and dryed well with dry Fuel, set it on Fire,
and when it is turned and dryed well, burn it, that the
Earth may crumble lightly, and scatter Earth and Ashes
over the Land; then Plough it up, and divide your Land
into such Ridges, and Proportions as the Drain will bear,
and so it will be fit to take the Impression of any proper
Seed, and especially Cole-seed, or any Grain, if you have
your Lands sound and season, and not Plough them too
long; and when you lay it down, let it be either upon
Oat-stubble, which will search it well the first or second
Year, or upon Wheat, or Rye-stubble, harrowing and
smoothing the Land, and then it will be well covered the
first Year: And if any of these Lands have been recovered
from the breaches of the Sea, or overflowings of Salt wa-
ter, you must drain them moderately with fresh Water, to
take out the Saltness, Marle them well, if Sandy, and lay
on some bearning Soil; keep the Trenches you have made
strong, if they be new Works, turning them well to the
Sea-ward, that the Waves may not, by their bearing, work
into, and wear away the Earth: for when they are wea-
kened, if they break, admit of holes, or cavings in it, it
is a sign the Sea is undermining your Work to ruin it, and
therefore it requires speedy Reparation. These Lands

well manured, will bear most sorts of Grain, and in fitt time very good Pasture or Meadow.

CHAP. XXIV.

Discoveries of Abuses in Ploughing, and how to Remedy them, &c.

AS in all other things there are some Defects, so especially in Ploughing, which cause some to blame the Soil, when themselves are in fault; therefore I shall endeavour to Rectifie some Abuses herein.

In the First place then for true Ploughing; The Plough should be rather made to be suited to the Irons, than the Irons to the Plough; for if the Plough-irons be not made exceeding true in all points, according to the Land designed to be ploughed, and wrought fair and smooth, the Plow-wright cannot work true to a false foundation, and if not wrought true, it will rarely go true, unless after much wearing, being wrought into work, it may plough, at last, reasonably well, but by that time it will perhaps, be in a manner worn out, but never with that compliance and ease as if it were of true workmanship; another defect is, in not well steeling the Irons, and making them sharp and well pointed.

In the Second place, He that works a Plough according to the Rule he has only learned by Trade, not knowing how to hold a Plough, nor to apply himself to the nature of the Land, or, according to the alteration of it, may scarcely be able to discern the falsity of the Smith's workmanship, or an-used to all sorts of Lands, and the several kinds of Tilths the Plow-man gives, his Rule cannot be certain; and therefore if he makes a true Plough, he must rather hit on it by guess, than infallibility.

Thirdly, There may be abuse in him that holds the Plough, if he be not of ability to order it, to fix and alter the Irons, and the Plough also, if occasion requires it,

according to the divers natures of the Land he ploughs in, and to the manner of his ploughing, and keep the Iron in a keen, and true posture; for at sometimes he is to throw down his Land, and at other times to raise it up, sometimes to go up Hill, and at others down Hill, and then again upon level ground; and in these cases, if the Plough be true, and the Plow-holder unskilful, there is a great defect, and many good Ploughs are utterly spoiled in this mis-usage.

Fourthly, Consider that all Ploughs are not to go in all Seasons, nor upon all sorts of Lands; therefore must they be chosen suitable to wet and dry, tough and loose Lands, or the Cattle may be spoiled, the Man toiled, and the Plough spoiled, and yourself disappointed in the well ploughing of the Ground; therefore for the discovery and rectifying these Abuses,

First, As to the Smith, and his truth of workmanship, they principally lye in the three Materials of the Plough. 1. The Share. 2. The Coulter. 3. The Breast-plate, or Shell; or, as some call them, Shivers. All which being made true, and according to the natural cast of the Furrow, so that the Earth sticks not upon the Plough, but the Irons wear bright, and clean, it is a proper sign of the truth of workmanship on his part. Thus to describe these. If it be a Share made with a Pan to put on a wooden head, then it must be made deeper than the ordinary Share, but in breadth the Pan must not be too large, or wide, and the Plain made broad, wheeling, or descending to the right Hand: and in this case, there are these two advantages, the deeper the Pan is, the thicker and stronger may the head be put on, and it will last the longer.

Secondly, The Fin, or Lash of the Share will wheel the more when set down to the Work, which is the level or bottom of the head, or rather somewhat lower, which will give it a considerable advantage in clearing the Earth at the Throat, or first entrance on the Nose of the Shield-board with more ease, for the Earth there, being once be gone all along the Plough.

A Share made stoll hanging from the Nose of the Breast-board, and not flat, as most are, viz. it should be pitch

d, or set on the Plough-head, a little hanging likewise the Right Hand, and the Plough-head pitched hanging likewise: As for the breadth, I must leave it to Experience, as the nature of the Land requires it. If upon a stony, or twitchy Wood-land, it must be narrower, and the more Flinty the narrower yet; but as the Land softens it may be encreased in breadth, so that it may cut up very clean the full breadth of the Furrow you carry with you, and not take it with the breadth of the Plough, which encreases the weight and strength, as those Ploughs mostly do, who go with narrow long-pointed Shares.

Secondly, As for the Coulter, it must, for truth of work-manship, be well fleeled, and wrought thin and sharp on the edge, the point and the edge looking directly forward, neither carving or turning towards the Land, for that is usually apt no draw the Plough too wide, and if look into the Furrow, it will draw it too narrow; but let it be just straight in a line to the pitch of the Plough. And now for the Plough-holders Direction, I shall give some general Rules.

First then, It is to be considered, whether he be able to judge and determine the truth of the Plough-wright's, and Smith's workmanship, and in case he finds therein an Error at first to mend it, which is then easier done, than when the Plough and Irons are wrought into it, or a great Error.

Secondly, When he has his Plough, and all other Accoutrements compleat, let him be sure to make his first Essay upon workable and regular Lands, and not upon stony, rooty, or twitchy Grounds; because upon such, a true cannot be observed, nor a true demonstration had of the goodness, and truth of the Plough; because such Lands will more easily writh, and suddainly wrench a new Plough out of his work, before it be wrought into it; but when he has tryed, and well seowered it in moderate Land, he may bring it by degrees to others.

Thirdly, Having got a perfect Furrow, his Plough a-taking all Earth as it takes it on a breadth, carrying a fair Furrow along with it, turning it cleverly from it, let him look upon it as a choice Plough, and clout it with

clouts or slips in all the wearing places smooth and even, strengthening it with an Iron bolt at the Neck of it, from the bottom of the Head through the Beam, and then strongly drawn and clottered fast, if he have none before, that the Head may not draw the least; for a Plough having been drawn in the Breast, or Neck, it probably may be wholly spoiled. The next care must be, to keep the Irons sharp, clean wrought, your Coulter edge thin ground, the Phin sharp, with a very small point upon the Share well steeled and tempered; and then if your Cattle be well matched, or sized, it will go with abundance of ease and celerery, and the Ground be well ploughed, to the Ploughman's credit, and the Master's profit. Lastly, He must be able to judge of the Land, and Seasons of ploughing, and to sort his several Ploughs to each alteration, or, at some Season, he will not be able to Plough, especially all his Land; therefore this business, properly timed, is a great Advantage, and much facilitates the Labour.

CHAP. XXV.

A Description of the most necessary sorts of Ploughs used for Tillage in England.

AS for Ploughs, there are several sorts used in *England*, according to the Custom of the Countries, or the liking of the People, and particularly four sorts are much affected.

1. *The Single-wheel-plough, and Foot-plough,*
2. *The Wheel-plough, called the Double-wheel-plough.*
3. *The Simple-plain-plough, without Wheels, or Foot.*
4. *The Dutch-husband, or plain Dutch-plough.*

Many other form there are, some of them alter in their Heads, others in their Beams; some again in their Stales,

and most in their Shares; of all which, it would be too tedious to discourse; wherefore I shall properly handle the Four premised in this Chapter, because I conceive them all very useful in some sort of Land or other, But to my purpose.

Of the Single-wheel-plough.

The Single-wheeled-plough may be used on almost all sorts of Land, and is of much lightness, and nimbleness in working. The main Plough-beam that this sort of Plow requires, is very short, *viz.* about five Foot, and must be made of strong and lasting Wood, as small and light as may be; to which is another false Beam added, below the Coulter-hole, under the other, and fixed to it by a Staple drove up into the true Beam, with a caping upon the false Beam-end, and some other way; which false Beam is that, by which the Plow is drawn, giving an opportunity (by a Standard put into the end of it, bored full of holes, and passing through the Master-beam) to set the Plough up and down to any gage of depth, or shallowness, as shall be required, and the Beam is proper to guide it.

The Sheath is pitched very forward from the Beam into the Mould of the Share; whose Share, as I may term it, is made as long as the head should have been: and of the same use of the Plough-head, made of two small slips not so heavy as the head be; and there being no head at all, the Land-handle is put into the Share-mould with an Iron Pin, as also is the Plough-sheath, and fixed there fast with an Iron Pin, and the Share forward, made like another Share; and before the Breast-plate is a hole made through the Share, and there it is riveted, or else with an Iron hook put into a long Iron slip; which is to be made an Inch, or an Inch and a half broad, coming up to the Beam, before the Nose of the Shield-board, running through it, and is clottered on the top of the Beam, lying on the Shield-board, and the Shield-board is compassed a little below in the Breast; and so before the middle begins to wind and whirle toward the Furrow, and so more and

more winds to the very end, and this Breast-board is placed close on the Share made with a long Point, and narrow or broad Plain, as the Land requires, and sometimes any ordinary plain Share may be used and placed on the Head, as other Ploughs are, either with a narrow point for Sconyness or Gravel, or with a broad, plain, and long-sharp Point for mixed Sandy Earth.

The Pitch of these Ploughs are about two foot in depth, and 8 or 9 inches in wideness, and always be careful to observe, that the upright or pitch your Plough at goes the narrower, and the more hanging it is, the broader it goes. As for the depth, I cannot conceive it is much material, because it is born up from the false Beam, till it comes to a true working pitch; and an Iron Axletree is planted in that false Beam, an inch or a little more in circumference, and about a foot long, 9 or 10 inches before the end of the false Beam, and put in square unto the Beam, that so it may be very fast; and at the other end of the Axletree runs a Wheel upon it, about 18 or 20 inches, and sometimes a little higher or lower, as suits best the Dryness or Wetness of the Ground; and this guides the Plough from the false Beam that it cannot sling or draw into the Ground, and so either with Horses or Oxen is drawn at the end of the false Beam with a Cock or Clevet, as occasion requires it.

That Mortise in the Standard, fastened to the lower Beam, and runs through to over-gage the Plough, ought to be near two foot high; and in the over-end two holes are to be made to put the Horse-Reins through to come from the Horse-head to the Plough-handle; so that he who holds the Plough may guide him, and under those divers removing holes, and in the Beam one or two equal to those in the Standard, and an Iron Pin put through them both.

These Ploughs are very expeditious in a light Ground, managed by one Man, and may be drawn with one Horse to plough in Seed-Season, an Acre a day. The Double-wheel-plough is extraordinary in use in *Hertford-shire*, and many other up-land Counties; very useful upon Slinty and Stoney Ground, as also in hard Gravel, or any other

other hard Ground whatsoever, after it comes to exceed in natural Temper: It is usually drawn with Horses or Oxen in Double-geer two a-breast, and so indeed they draw the strongest, though they injure the Ground the more by Treading, therefore it is my opinion in wet Seasons they may be put to draw single in length.

Of the Double-wheel Plough.

This *Double-wheel-plough* is best made of a strong short cleft Ash, about six foot in length, the Beam requiring to be contrary to all others in the compass of it; the crook or compass must look upwards, and the Land-handles are to be placed at the great or nether-end of the Beam, as in other Ploughs; for it usually is made with one handle, and the Plough-staff is to serve in the place of a Furrow-handle, and in length answerable to the proper handle, which tends much to the ease and certain holding of the Plough.

Make the Sheath of the toughest of young Ash, well seasoned, set with a very good Mortice much forward: Let the Joints be true and well closed unto the Beam, driven up hard with a Braget behind it, to keep it from declining, so that in the strongest Land it is to cope with all, it may stand well to its work.

Let the Head be pitched as strongly as may be to the nether-end of the Stilt and Sheath, being to be well pinned through both, and the Share must be pitched upon the Head at a very deep pitch, and somewhat hanging; by which means the Plough will go much a-shore, because the Holders usually go two Furrows off the Plough wider on the neer side of it: And as it is pitched deep, near a full yard, so it is likewise very broad, being near half a yard; and that I conceive to proceed from the Man's going so far wide of the Plough. The Share, for this Plough, must be made exceeding narrow, yet very strong, and running out to a good length in a small point well steeled; and sometimes, as the work or nature of the Ground requires it, you may add a Tush or Pain, but they likewise make it very narrow, and so it must conse-

quently be the Hardneſs and Stonyneſs of the Land, not admitting of it: As for the Coulter, it muſt ſtand a little above the Share point, not before, but rather behind it.

The Wheels of this Plough, that properly bear it, may be about 18 or 20 inches high, and made of about ſix Spoaks of Wood or Iron, well faſtened into a Nath or ſhort Hub of Wood, and a Bark Hoop or Iron Binding round about them, and to run on an Iron Spindle about two foot long, running round in a Boulſter, borne by the Iron Spindle three or four inches thick, lying between the Wheels, fifteen or ſixteen inches or ſomewhat more in length, and 18 or 20 inches at leaſt in heighth, ſtanding up to bear the Plough-beam; and upon that Boulſter muſt go up an Iron Pin 8 or 9 inches above the Beam, to gage it as to its true depth; and to the middle of the Boulſter muſt be faſtened an Iron Chain backward, with a ſtrong Iron Collar, much in the faſhion of a round Ring, which compaſſeth the Beam, being moveable, that as it is put forward or backward, the Plough may go ſhallower or deeper, as the occaſion requires, and may be held in its place by an Iron Hammer, the Helve or Shaft being all ſolid; and by taking it out, and putting it in, to take up or let down at pleaſure; and, as the Plough at the Land's end turns out of work, it muſt have ſome ſtrong Cords or Whitleather to come up from the Boulſter to keep the Beam from ſlipping off, being empty.

This Wheel-plough requires a conſiderable Strength to manage it well, becauſe of the conſiderable Lengths they are made of, which carries in working a conſiderable weight of Earth upon it, adding very much to the burthen of it, which in ſome degree may be remedied by contracting theſe Ploughs into a ſhorter or narrower compaſs, and taking off as much of the weight of the Wood and Iron, as the ſtrength of the Work will bear upon which it is to be employed.

Of the Turn-wrest-plough.

There is yet another Double-wheel-plough, called the *Turn-wrest-plough*, moſt commonly called the *Kentiſh-plough*, as being very much in uſe in that County: This is a Plough, whoſe Beam may be made of any Wood for the bigneſs of it, but Aſh I account the beſt, but the two handles may be made of one forked piece of any Wood, and the Beam tennanted into the Stilt before the Fork running down into the Plough-head: And as for the Sheath, it muſt be a good ſtrong piece of well-ſeaſoned Aſh, tennanted into the Beam directly down-right; yet looking forward at the nether-end, and ſomewhat fixed into the head, as other Ploughs are; however, the Sheath downwards muſt be far bigger, and the head of it pitched at a very great depth, or elſe at random, for depth being carried with two Wheels, but nothing like to near and eaſie as the before-mentioned two Wheeled-plough. For breadth, it muſt be pitched under the Beam upon a ſtraight line; nor is there to be any Shield or Breaſt-board on either ſide the Plough, as other Ploughs have, but a little piece of Wood ſet along the Sheath forward, about three inches broad, cloſing upon the Share, juſt as if you were to cut a Dye in the midſt from corner to corner, and place the flat-ſide to the Sheath and the edg forward, which is to be the Breaſt-board.

As for the Share, it is to be put on the Plough-head with a Phan half round upwards, and flat downwards, and ought to be ruſhed a little on both ſides, as the ordinary Ploughs are, and ſo it is to run out to a ſharp point.

Some of theſe Ploughs are made with one Wreſt, others with two, and the latter I account the beſt and ſureſt; and theſe Wreſts are to be put upon Pins, one in the Sheath, ſtanding immediately under the Breaſt-board, and the other unto a longer Pin, or round Staff fixed unto the bottom of the handle as wide as the Furrow; and this Wreſt may be only a round Stick about two foot long, or as ſome have it, a half round with two holes to put the aforeſaid Pins into; and at every Land's end, this Wreſt

muſt

must be turned on the other side; so where there is two, they must both be likewise altered, and one placed two or three inches higher than the other, and the highest is to be placed broader by an inch and a half, two inches, and sometimes three inches, than the lowermost, that so it may cleverly and cleanly cast the Furrow over.

As for the Coulter, it must be moveable in the Coulter-hole (that being made very wide) at every Land's end; and to this purpose, there must be a strong Ground-Oak Plant about an inch and a half over very tough, and with that you may (having two pins placed on the top of the Beam at an equal distance one from the other, and both equally distant from the Coulter) wrest it, or wrest it from one side to another, and there hold it till you come to the Land's end, and there turn both Wrest and Coulter.

This is a very good sort of Plough for ploughing Lands that lye on the sides of Hills, and cannot well be ploughed either upwards or downwards; or if you have any flat level piece where you would not have one Furrow discovered, this will perform it very well, the foremost Horse or Ox going in the Furrow, and the nearest upon the Land, and ever double; and for those sorts of Ground it is extraordinary useful to cast the Furrow.

Of the Double-plough, ploughing two Furrows at once.

The Double-plough is in many places advantagious, taking two Furrows at once, though a very plain Plough; it is made with one long Beam, and another short one, not much more than half the length of the other; the first must be made a compleat plain Plough, except the Handles, which may be very short, only so long as to receive the Beam with the Land-handle, and place the Shield-board on the Furrow-side, which may be done with a round Staff, from the Beam to the Shield-board, which Handles excepted, it is one compleat Plough in all particulars. The hinder end of the Beam must be left a little stronger, because of the fastening the other Beam firmly to it.

As for the hindermost Plough, it must be made in all the Members and Branches like the other, except the Beam cut off about three inches before the Coulter-hole, and the Handles at length and strength like an ordinary strong plain Plough; which being done, as the Handles upon the last Plough, you must set to the placing of it in its

At first, the Plough standing in its working posture, the handled Plough is to be affixed to the nearer side, or the left-hand, one Furrow-breadth under the other, and just in the very same posture, both for breadth and depth as the other, and so held off from the first Plough-Beam by a lining or filling of Wood, just the Substance as may continue it fast and firm to a just Furrow, and there drawn close and firm to the Master-beam with two small bands of Iron, and a broad Slout or two of Wood, all which may be so keyed and cramped up, that it may be as one solid Beam, and consequently move as the first moves, either for depth or height; and this I hold may be the best used when the Plough-foot to guide the depth of it, except you place a Wheel to the foremost Beam, but do it not in the false Beam, because Experience teaches it is best in the end of that Beam to have as good a Mortis as the Beam will bear, which is a Mortis for the foot, and in it place a square piece of good rough Ash, or, if you can conveniently compass it, Iron, into which you may put your Iron Axletree with its Square, and so fitted into three or four several holes of it.

By the means directed, the Plough may be set at a Working-gage, and continue or alter it as it best suits your business; and the Plough thus accoutered, you may very well put it on ordinary Arable Land, a double Proportion also upon Lay-turf that is clean: And this may well be managed by two Men and four Horses, that have been a little used to the Work; but upon rough or stony Land, it will not do so well.

Of the Plough carrying a Harrow after it.

There is yet another kind of Plough that will carry a Harrow after it, and do both works at once; and this is of good esteem in *Norfolk*: This must be a common light Plough, and a light Harrow which must contain three little light Bulls, and there five times in a Bull, and they must also be made light, and fixed to the Plough at one end of the Beam, that on the carriage of the Plough this may come with it, and as the Plough turns one Furrow, the Harrow turns over, overreaching two more Furrows, and so by the overreaching, it strikes two or three times in one place, which may well cover the Corn: But then here some will object, I must needs take up a great deal of time for a Swedsman to follow the Plough works, when but one Acre can be well ploughed this way in a day, and he can plough two. To this I answer, A Riddle placed on the Beam of the Plough, to scatter the Corn proportionably as the Harrow follows to cover it, the motion of the Plough jolting or forcing the Seed out by such degrees as is proportionate to being scattered out of the hand, and by these means much Labour and Time are spared, the Business being done at once that requires three times; but this cannot in words be so well described as by seeing and practising.

Of the Dutch *Plough.*

The *Dutch* Plough is proper for Fen and Marish-Lands, where Stones root, or hard places come not to hinder it, and the chiefest advantage it hath, is Ease and Expedition, by reason of the Breadth and Sharpness of the Share, which is to be made about a foot and a half broad, sharp in the Point, and as thin in the Thin as a Knife, casting up a great broad Furrow very clean, with much possible ease.

As for the Coulter, it is especially applicable to the aforesaid Lands, but may be used upon any fair pure lay Turf if it be old Pasture: As for the bastard *Dutch* Plough, it is more suitable to the various sorts of Lands, but the

Iron

Irons must be prepared very sharp, as the former, made of the best Steel to the point and edge of the Share and Coulter, carrying a true proportion; but these last, not being much used in *England*, the particular description of their make will not much avail our English Plough-wrights, nor indeed the Plough-men, who have sufficient experience of our own substantial Ploughs.

Thus have I been pretty large upon this main Instrument of Husbandry, that nothing necessary in this Work may be omitted, that can reasonably conduce to the advantage of the industrious Husband-man; and indeed, on his care (next to the Divine Providence) the Supplies of the Nation, in a great measure depend; for if the Plough desists, and the Earth be not manured for encrease to produce its fruitfulness, neither Gold nor Silver can encounter with pale Famine, which must needs encroach upon us, Bread being properly called the Staff of Man's Life, &c.

CHAP. XXVI.

A Computation of Work to be done by one Man, in one Day, in the sundry Occupations relating to Husbandry.

HAving proceeded thus far, for the most part upon Particulars, I come now to say something in General about Husbandry, briefly touching several things worthy of remark; and these I must chiefly attribute to a Country, where it is tolerable, without any extraordinary difficulties.

As for Ploughing, a Man may, in light sandy Ground, turn up two or three Acres with one Team in a day: when in stiff clayey Ground, one and a half is a sufficient day's work; and in very light Ground, four at the least; and what is sowed, may be harrowed the same day.

An able Man, expert in mowing, may well Mow (in a

a good deep loggy Meadow, or a rough and uneven Meadow) about an Acre and a half in a day; and of short thin upland Meadow, at least two Acres each day.

As for mowing Barley, or Oats, if they be loggy, thick, and beaten down to the Earth, making fair work, and not cutting off the heads of the Ears, leaving the Straw still growing, one Acre and a half a day: but if it be thick and upright, then two Acres, or two and a half may be reasonably mowed. If the Corn be short and thin, then he may Mow three, and somewhat more, without over-labouring. Of Beans, he may Mow as much; and of Pease and Beans, having a Hook to follow him, no less; for this is a Work the least troublesome.

As for Reaping, one Man with a Binder may compass an Acre of Wheat, or Rye in a day, if it be choice good, and well standing; but if flatted, or beaten down, then three Rood is very reasonable, and five Rood if it be thin and upright. Of small Pease, Fetches, and the like, he may cut up two Acres a day. As for the gathering and inning of Grain, it cannot be well proportioned, because ground bears more or less, the inning may be at a nearer or farther distance, and therefore I shall leave this to the Master's care, or such as he shall appoint to see it hastened, with as much convenient speed as may be.

In thrashing Corn, care, as well as haste, must be observed; and if the Corn be full and clean, free from any abuse, or poverty in the Grain, a Man may Thrash, and order, four Bushels in a day of Wheat or Rye; six of Oats or Barley, eight of Pease or Beans; especially if the Pease be full and in plenty, otherwise he cannot Thrash so many of them as of any other Pulse; for though they require as many strokes, and as much turning, yet they yield not, and labour is bestowed of them when they answer it not.

As for the labour of Ditching, a Man may, in one day, Ditch and Quickset, of a reasonable Ditch, three Foot deep, and four broad, a Rod or Pole, allowing sixteen Feet to the Pole; and so less Ground of large measure, less proportionable to the sufficiency of the Fence undertaken.

As

As for Hedging, If it be substantial and good, viz. five foot high, well bounded, thick stocked, and close layed, two Pole or Rod in a day is sufficient; but thinner and lower, then double or equivolent to a proportion.

Plashing and making Quick-fence, is another labour, which to well order, if the growth be high and well grown, you must lay it thick and close, strongly binding in the tops, turning the quick downward and inward; and of this a Rod a day is a good day's work: but if he plash it down, and only lay it along, regarding more thickness than comelineſs or order, then he may do as much more with ease: and indeed the care of fencing in inclosed Counties is one principal matter, for a good Fence once made and setled, saves a Man a great deal of labour and trouble.

As for Delving or Ditching, which some Grounds require, where Woods have been grubbed up, and not well cleared of the spreading Fibres of the Roots; then, of very difficult Ground, if it be to level, he may dig a Rod in a day; but if he dig very deep and trench it, or manure it, as proper, then three parts of a Rod is sufficient; for ordinary delving requires but one Spade's graft extraordinary, to take up the heart of the Ground, requires much more.

CHAP. XXVII.

The Variation of Soil in the several Counties, requires different Measures to be taken in Agriculture, &c.

IT is proper, in this place, to be considered, that there is a variation in Husbandry, according to the Country, and therefore there may be difference in Rules to be observed, in divers places, according to Air and Earth; and the greatneſs or smalneſs of the heat: or as moisture and

and cold doth decrease or diminish: And to these must the Husbandman tune his Seasons, Labours and Instruments; for in stiff Clays, of which all the fruitful Valleys of this Kingdom are composed, as, also in *Huntington-shire*, *Cambridge-shire*, *Bedford-shire*, and many others, all manner of Arable business must be begun early in the Year, and the Ploughs, and Instruments to be used, made of the largest size, the Timber strong, and the Labour great and painful; so also in Soils that are mixed, and very good and fruitful, as *Hertford-shire*, *Northampton-shire*, and most part of *Berk-shire*, *Essex*, and *Kent*, with other Counties of the like nature, Arable Labour ought to begin in the latter Season, and the Instruments, and Ploughs, made of a middle size, and the Timber indifferent, and less Labour will serve than in the former: But the light Sandy Grounds having a natural fruitfulness in them, as *Surry*, *Suffolk*, *Norfolk*, and many parts of *Lincoln-shire*, *Hamshire*, &c. the Arable Toils may begin at the last Seasons, and Ploughs with Instruments, may be of the smallest and lightest size, the Timber smaller than the former, and the Labour less.

As for all barren unfruitful Earth, as in *Cornwall*, *Devonshire*, many parts of *Wales*, *York-shire*, *Chesshire*, *Lancashire*, and *Derby-shire*, and the like, the ploughing and ordering is to be in a fit Season, according to the temperateness of the weather, which if it happen early, you must begin your Labour at latter Seasons; and there is no true proportion to be given here for the Plough and Instruments, but they must be framed according as the Ground is stronger or weaker, and therefore rather follow Reason in these things, than Custom, and then by experience you will find less labour, and better thriving.

CHAP.

CHAP. XXVIII.

What is required in Husbandry, in order to Oxen and Horses, for Tilling of Lands variously Situate, &c.

AS for the Office and Duty of a Husbandman, it requires great care and diligence, and therefore I will speak something farther of it than yet I have done.

And first, to lay his Lands to his own profit, and the ease of the labouring Cattle; let him observe if his Arable Land shall lye against the side of any steep Hill, as mostly barren Lands do not, then plough such Lands directly against the Hill, beginning below, and so ascending upwards, if the assent be not very easie; for this will so weary your Cattle, and make them irksome, that they never go through it, if it be any thing considerable, and the beating and calling them, will fret and spoil them; but on the contrary, in such Grounds, plough sideways, overthwart the Hill, that your Beasts may tread on the level Ground, and so shall the Compost and Manure which is laid on, not be soon washed away from the upper part, because the furrows not lying straight downwards, the washings of the rain stop, and cannot descend, and so the Soil is kept in.

In the next place, it is a Husbandman's care, to know what Cattle are fit for draught, and the Tillage of his Ground; whether Oxen, or Horses, or both of them together: In cold stony mountainous Countries, Horses are preferred, though in most Counties Oxen are sure, and of great valoe in this Labour, as being steady, very strong, and sober in their pace, so that the Ground may be ploughed deep, and carefully; and besides, when their Labour is done, they turn to advantage by their Hides, Flesh, &c. In many Countries, Horses are preferred, because they serve

serve for other uses, not proper to those, and endure Wet and Hardship better; and indeed in driving, if you make that Speed with your Oxen as you do with your Horses, you will not only tire, over-heat, bruise and spoil them, but render them unfit for Labour or Feeding; but if you have a sufficient Stock to keep Oxen and Horses, put the first to plough near home, and keep them to their moderate pace only, and they will do well enough; and let the latter draw the Cart, or be inured to the Plough where Expedition is required, according to the Roads or Ground, as the Countries lay, or the Fashion used among your Neighbours, though I cannot consent that Custom is so much to be followed as some plead for, if it be dissonant to Reason and true Experience; therefore in dubious Husbandmen try many ways, and stick to that which redounds to their best advantage.

CHAP. XXIX.

Proper Things to be observed, and done throughout the twelve Months in the Year.

THere is one thing more to be considered, in which a Husband-man ought to have regard to, and that is proper Seasons of the Year for particular Labours, all these I shall briefly set down as far as they concern the present Discourse.

In the Month of *January*, if you live in a good fertile Soil, among rich simple Clays, in the first place plough the Pease-ground, that it may lye to take benefit before it is sown; but if in fertile and well-mixed Soil, then in this Month; if the Weather be open, water such Pasture or Meadow-Grounds as require it. Drain, and make up Arable-Lands, especially where you are to sow Wheat, Oats or Barley; the following Seed-time dub up the rough Ground you intend to sow the Year following, and

you

your own Health keep warm your Body; feed on good wholsom Diet, and rather with Exercise than Sauce, whet, and encrease your Appetite.

In *February* set or sow all sorts of Beans, Pease, and other Pulse; and the stiffer your Ground is, begin your Arable-Toil the sooner; Forbear Meats that are flimsy; take heed of cold and plegmatick Humours, and if need, or any accident require, bath and purge; and if the Weather be seasonable, you may bleed, but not too lavishly.

In *March* end the sowing Season of all sorts of small Pulse, and begin Barley, Rye and Oats; the Rye must be that which is called *March* Rye. This Month, if necessity require it, you may often bath, but not bleed; unless it be upon Extremities; purge gently, and let your Diet be temperate and cooling.

April requires you to finish up your Barley Seed-time, and order your Ground for the Sowing of Hemp and Flax; cut down great Oak-Timber, that the Bark may the better rise; scower Ponds and Ditches, and gather what Manure you can to your Lay-stall; lay your Meadows light, and your Corn-ground; gather Stone from off the Land; set Osiers and Willows to make good your Fences; cast up Banks and Ruines for the repair of all decayed Fences; and, where Health requires it, purge, bath, or bleed; use moderate Exercise, which stirs the Humours in the Body, and causes a healthful Constitution, with the use of temperate Meats and Drink, which Nature loves after.

In *May* sow Barley upon all light Sands and burning Ground, as also Flax, Hemp, and tender Seeds; Summer-stir your mixed Earths, fallow your stiff Clays, soil all light and loose Sand: As for barren Earth, prepare it for Rye and Wheat, stub the Roots of Broom or Fern, Gorse or Furz, burn Bait; begin to fold your Sheep, carry out Manure, and bring home Fencing and Fewel; weed Winter-Corn, Cut all sorts of Grass either in Forrest or Pasture.

For your Health use Drink that will cool and purge the Blood.

In

In *June* carry Marle, Sand, Lime, and other Manure of any kind, to the Land; lay up store of Fuel, shear your fatter sort of Sheep early, cut rank low Meadows, and for Health be temperate in Diet.

In *July* take seasonable Weather for your Hay Harvest, for there is much Discommodity and Loss in neglect; Summer-fallow rich stiff Grounds; Latter-fallow all loose Sandy soil all mixed Grounds; fence up your Copices, graze your Elder Underwoods, and bring home all Fire-Timber.

As for Health, abstain from Bleeding and Purging, unless in necessitous Cases; be not over-venerous, not medle nor with Superfluity of strong Liquors.

In *August* apply yourself to take the best seasonable time for your Corn-Harvest; Mow Rye, Wheat, Barley and Oats, and be moderate in all your Diet; Labour and Exercise, for this Month is full of Diseases very dangerous to Life.

In *September* cut up your Beans, Peaſe, and all other Pulſe, and put an end to your Harvest: Manure your Wheat-Lands; sow Rye and Wheat in rich and barren Grounds; Thatch your Stacks of Wheat; Thrash Wheat and Rye, and order all your necessary Affairs abroad, that they may not be hindred by Overflowings, occasioned by great Rains or falling Snows, or the breaking of the Ground into deep Ways.

For Health sake, this Month Physick moderately, forbear eating too much Fruit, especially those that are luscious, lest they infect the Blood, and create Diseases, and be temperate in Meats and Drinks.

In *October* finish your Wheat-sowing, scower Ditches and Ponds for Manure, plash Hedges, and set Quickset; make an end of Winter-ridging, draw Furrows to keep dry by well-draining your new-sown Corn, make store of Malt.

For Health, take moderate Physick from a skilful hand, use moderate Recreation, and feed well on wholsom Diet.

In *November* it is proper to sow either Rye or Wheat in very hot Soils; cut down all sorts of Timber for Ploughs, Carts and Axletrees, and other Husbandry-Utensils or Instruments; break all such Flax and Hemp as is designed for Spinning and use in the Winter-season.

For Health and Vigour, eat strong wholesom Meats for good Digestion; and, unless for extream cases, there's never need of Physician nor Physick; for all dangerous Diseases are full, unless Excess stir them up by Surfeits, and other Forcings of the good Constitution, and unnatural Temper of the Body.

In *December* begin to plough up your Ground wherein you only intend to sow clean Beans; drain your Cornfields if it be open Weather; keep your Meadows indifferently moist, but not with deep Overflowings; provide a good store of Houshold-Provisions; and rejoice in the Labour of your Hands.

And for Health eat Meats that are hot and nourishing, and comfortable Liquors, and so you may bring the Year out with Profit and Satisfaction.

CHAP. XXX.

Utensils and Tools necessary for the Husband-man, for Arable-Land, the Barn, Stable, Meadows and Pastures, &c.

HAving proceeded to speak of Day-labour, I think it not amiss to say something of Carts, Waggons, &c. may facilitate some part of this Labour, in being well ordered and rightly applied: And to have these in good condition, observe the Ground and Ways they are to be used in, and the Weight proper to be drawn, and make them stronger or lighter, grosser or slenderer; and observe more upright, or square the Spoaks are from the Nave or Center, the heavier the Weight leaning on that side bears on them; and therefore to evade that as much as

may be, they are to be placed toughing in outward [illegible]
the Wheel may appear somewhat concave, which [illegible]
prevent it from any Slip or Wrench in Stoney, or [illegible]
rough Ground that may occasion any ease breaking; [illegible]
the longer the Wheel is, the easier it moves; because [illegible]
about being more flat, with greater facility it passes [illegible]
any Stones or Hardness where jumpings when laded [illegible]
endanger; and a Wheel of eighteen foot circumfer[illegible]
requires as much Ground in one Turning, as one of nine [illegible]
an Inch, moving slowly on the Axletree; so that it ra[illegible]
more easily to do, and carry the Load with [illegible]
more ease; though the lower the bed of the Cart is pla[illegible]
also lower the Load is secured from over-turning.

Besides Carts and Waggons, there are Tools and [illegible]
fit proper to be inserted, though not unknown to [illegible]
chief grade in Agriculture, &c. yet I shall here insert [illegible]
in their proper places, to be the more ready at hand [illegible]
Land.

Belonging to Arable and Field-Land.

Harrows, Drags, Forks, Sickles, Reap-Hooks, Wee[illegible]
Hooks, Pitch-Forks, Rakes, Plough-Staff and Beetle, Sc[illegible]
es, Rowlers, Mold-Spears and Traps, Cradle-fides, Sc[illegible]
Lips.

Belonging to the Barn and Stable.

Ladders, Wisks, Winnowing-Fans, Corn-Meal[illegible]
Sieves and Rudders, Brooms, Sacks, Sckeps or Sc[illegible]
Bins, Pails, Curry-Combs, Main-Combs, Whips, Co[illegible]
Harnets for Horses, and Yoaks for Oxen, Pannels, W[illegible]
keys, Pack-Saddles, Stirrings, Cart-Lines, Skreens [illegible]
Corn.

Belonging to Pasture and Meadow.

Rakes, Scythes, Fauls-Forks, Prongs, Tedders, Clo[illegible]
Shackles, Cutting-Spades and Hooks, Horse-Locks, [illegible]
others of lesser note, with which a Husband-man [illegible]
to be furnished at needs.

CHA

CHAP. XXXI.

To preserve your Grain, when sown, from all sorts of Vermin, who are apt to destroy or annoy it.

HAving said somewhat of bringing Ground to bear good Corn, as also the Methods of Sowing, especially barren Grounds, for that which is fertil has not any occasion to be treated of, but in some particular respects, which in the course of this Book will be laid down apart; it will now be highly necessary to instruct you how to preserve your Grain, and, in the first place, from the Destroyers of it before it springs up, *&c.* Rooks, Crows and Daws, are great Devourers of Grain; to keep these from your Land, shoot some of them, and hang them on Poles in divers Angles of your Field, stick their Feathers along the Ridges of the Land, lay Trains of Gunpowder, and blow the Powder up, or let it lye scattering in the most frequented places, and the Scent of it will make them, with a little Shooting, forsake the Field: You may also take great numbers of them by placing strong thick brown Papers twisted taper-wise, like those on Sugar-Loaves, in holes of the Earth, the broad top coming even with the Ground; Bird-lime the inside, and scatter some Grain in it, and then the Fowl putting in its Head to take it out, the Paper so limed will stick close and rise with him, when being blind-folded, in amaze he will fly up a great height and fall down again; so that if you be at hand, he may be easily taken: The scattering *Nux vomica* mingled with Grain, if taken by them, as it seldom misses, will make them so sick that they will forsake the Field; if you Limne your Corn, they will forsake it; if it be steeped in Water wherein Wormwood has been much boiled or infused, or sprinkle it with the Dregs of the bitterest Oil, it will do the like, by making them cast it up sick, and

not covetous of any more; and these, with hanging Bu-
ches of Feathers on Lines or Sticks, that they may dan-
and twirl in the Wind may, in a great measure preserve yo
Grain; and this latter may be as well when the Corn is t
as before: And these I give you as general Rules for Pige
and all other Devourers of Grain, relating to Birds, th
what you can they will come in for some share with you.

Pismires are another great Devourer of Corn, and
carry or bite off Chits or Sprouts, so that it will no
grow, but rot in the Ground a great quantity: To p
vent this, search your Corn-fields well, especially un
the Hedges, and the Roots of old hollow Trees, or
the Tops of Hills cast up; and if you find them the
pour Limed-water strong and hot amongst them, pre
ly after Sun-setting, and it will destroy them; for w
of Lime make a Lye of Wood-ashes, and it will do the
though not so effectually.

There are another sort of Corn-Devourers, called D
great black Clocks or Beetles, which lye under the C
and in Sprouting-time do great mischief: To des
these, make great Smoaks in your Fields in a still N
or a little breathing Wind that may carry it over the
face of the Ground, with wet Rubbish or moldy Pe
straw, Hay, or the like, and it will either kill them,
chase them from your Ground, for they are the gre
Enemies of all others to Smoak, and can least endu
and if your Ground be Limed, or you sow Lime a
your Corn, you may spare this; for if they bite when
Lime has touched, it kills them.

Field-Rats and Mice, also Water-Rats, destroy m
Grain: To prevent this, and ruin them, find out t
round holes when the Field is bare, and put Hem
Seed into them, and eating it will kill them; the so
ling of the Juice of Hellebore in them, will do the l
but above all, I approve to beat the common Grah v
small, mix it with a little Coperas, Vetriol, and C
Honey, make it up in Pellets, and scatter it in t
Haunts, in the mouths of their holes, or the most f
places, and the Scent will greedily draw them to it
all parts, and, once eating it, they will die: This ma

lso uſed in Granaries or Barns for other Rats and Mice, ith good ſucceſs.

Slugs and Snails do much harm to Corn, and Peaſe t ſprouting up: To kill theſe, the beſt thing is Soot or me ſprinkled thinly over the Ground, for touching it y will die.

Graſhoppers in ſome meaſure do much Injury, by feed- on the Leaf and Bloſſom of Corn and Pulſe, from the ſt to the lateſt: Theſe are hard to be deſtroyed hout very great labour, and that is by ſprinkling the rn with Water wherein Wormwood, Rue, or Centau- has been boil'd, till the ſtrength of them are quite en out by the Water; and if they bite where the inklings happen, they will die, and the Scent of any r thing is ſo offenſive to them, that they are never nd where any ſuch thing grows.

Moles are two ways deſtructive to Corn, viz. in eating Roots, and rooting it up, not making diſtinction of any , but taking all alike: There are divers ways of taking , but not ſo eaſily when the Corn is well grown, for they do their chiefeſt miſchief, when their Tracts, the Caſting up of their Hills cannot be ſo eaſily diſco- d: However, you muſt do it as well as you can, and you ſee them caſting up, or moving in their Tracks, them with an Iron of many Spears; or dig Pits in Tracts, and ſet earthen glazed Pots, which they blindly fall into, and cannot ſcramble out; or fill a n Jugg with Pitch, Roſin and Brimſtone, with ſome Tow or Rags, and, firing it, clap the Neck to the th of the hole, and the Air in the Earth, drawing the to a great diſtance, will ſtifle them; or mix the of Hellebore with Rye-meal, ſcatter little bits in the ws, and finding it in their way, they will greedily eat die.

CHAP. XXXII.

To prevent Smuttiness in Corn, preserve it against Blasts; the Injury of Black Frosts, Snow-water, Mists, and how it is to be ordered when reaped wet.

THere are other Mischiefs that befal Corn, those not from living Creatures, which I have laboured to find some suitable Remedies for in the trying many Experiments.

To prevent the Smuttiness and Mildew, before you sow your Grain, sprinkle the Ground over lightly with Chalk beaten very small.

Against Blasts, the properest Remedy is held, (observing the Season when they usually happen) to make Fires of Stubble or rotten Straw, and burn in them Snips of old Leather, the Shavings of Horn, and a little Brimstone, so advantagiously on the sides of the Ground that a small Gale of Wind may carry the Smoke, and spread it among the Corn or Pulse. This will likewise drive away Flies; and other Black Frosts are very injurious to all Grain, the piercing Cold chilling or killing the seminal Heat that propagates the Growth, and either withers or stunts it if it be extream, and without Snow: To befriend and keep off the bleak Winds, there is no better Remedy against this than to strow Ashes over your Land, either Wood or Sea-coal; and they add much Heat to it, and keep off a great part of the Cold; some throw Straw over it, but that proves a great Incumbrance, though other nourishes the Ground, and is good Manure for the Earth.

As for Snows lying on the Ground, it injures not the Corn; but upon Thaws, the Water being of a harsh Allum nature, much injures the Roots if it lie long upon it;

the best way to prevent it, is to lay your Lands high, your furrows deep, and to have suitable Drains to the lowest of your Ground, to draw it away as fast as may be. Great Mists and Fogs are very offensive, where they are grown, or rise from ill-scoured Grounds, especially from Fens, Sea-Marshes, Standing Pools, Lakes, &c.

The way of remedying this evil is to smoak the Land in the Evening with any sort of Fuel that casts a gross thick Smoak, which will in some measure disperse and keep up the Vapour that would otherways, by falling on it, be poisonous and offensive to the Corn.

Of Corn reaped wet, there comes great damage; for being so by Rain, and not time given it to dry abroad, or by the Unripeness, or too Greenness of it when mowed, if the Heat be great thereby contracted, it often sets it on fire; if less, it moulders, rots or moulds the Straw and Grain, that it is of little or no value. You may know when Corn is ready to reap by the much bending of the Ear, dryness of the Stalk, and hardness of the Grain; then if you see any Weeds growing up among it, that are but of moderate height, reap it as soon as you can to take in the less Weeds, or the Seed of them to encumber or soyl it. If Grass be grown high among it, and you cannot avoid reaping it with the Corn, take care to spread it in before you sheave it, and dry it well in the Sun till it wither and become as Hay very dry, and then sheave it, and shock it in small Shocks; then when it has sweat open it, and give it the Sun and the Air, that it may yet be more dry; then lay it in greater Shocks, and let it sweat again, and so open it, and when it is by this means well opened and dried, Ian it; but sometimes Rain or great Mists, causes a Weakness; if it be before the Turning, let it stand somewhat longer in Expectation of favourable Season; but if your Expectation be frustrated, and by the abundance of falling Rains the Corn is ready to be beaten down, grow again, or rot, you must of a Virtue of Necessity, reap it, carry it home, and when dryed and dryed a little under shelter, you must in Kills so dry it, often turning and stirring the Sheaves; and when it is dry, let it cool well, and more

from the dry, that the rain may come plentifully amongst it, leaving for this purpose a hollow in the middle of the Mow and underneath, and so it will be kept good and sweet.

CHAP. XXXIII.

Proper Directions for Stacking of Corn in the true Method, to keep it from Vermin, Fowl, Taking Wet, or Mufling.

WHere there is not a Conveniency of Housing, there is a necessity of Stacking Corn, and care must be used for the well-ordering of it this way, that it may be preserved with the least loss, also from Wet and Moulding; for a moist Ground, if the Stack be unadvisedly placed on it without any other Remedies, will spoil at least a yard of the Bottom; and therefore you must make and raise your Ground on purpose with Gravel, Sand and Pebles, or other Stones not subject to breaking, proportionable for a Stack, either round or a square, of triangular distance from Eves-dropping or the Dripping of Trees; and so that the violent Winds cannot blow the Rain, or Melting-Snow off from them (though they stand at some distance) upon the Stack; yet so that it may stand unsheltered from high turbulent Wind, that would strive to uncover it; then upon the Earth so raised above the Level of Water, occasioning Overflowings by sudden Showers, make four pieces of Stone or Timber like Blocks, broad on the lower end and narrower on the top, of equal height about two foot and a half, and fix the lower end a little in the ground, that they may stand steady; then lay on their tops square Boards two inches thick, and three foot square every way, strong and substantial, well seasoned, and free from warping; also take strong Overlays of Wood, and lay them from one Board to another, four

four-square, and on these place other smaller Poles close in a manner to each other; and upon this Frame stack or mow your Corn, Pease, Beans, &c. as near for conveniency to the Thrashing-Floor as may be; make the Stack neatly compacted and upright, which Experience rather than Printed Directions must instruct you in; and you will, if you be a little careful in it, save much Corn, for the broad Boards at the Corners will send off the Mice by their hanging so much over the Stumps or Blocks, and the height, together with the Poles, will prevent the Moisture from injuring it any ways from the Dampness of the Ground.

As for your laying your Corn into Stack, observe to turn the Eary-part of the Sheaves inward, and so the Pigeons, Sparrows, &c. will be disappointed: And of all Proportions of Stacks, I commend the round for the best; and when it is made, after some days setling you must Thatch it well to keep out the Wet; and when you stack your Wheat, let the top be Oats, or other coarse Grain, and so it will lye in greater safety from Wet, the top being ever in most danger to receive Damage: Fence it about with small Poles, that Cattel come not to damage it; and if your Stack be very long, you must have more Pillars to support it, as six or eight.

CHAP. XXXIV.

To know washed Corn, and how to lay up and keep it to the best advantage, all useful sorts of Grain in Granaries, &c.

THere is a sort of Corn, though it may be good enough for Grinding, is altogether nought for Seed, and throws away the Husband-man's Labour and Charge in sowing it, because it will not prosper, if at all it sprout up; and therefore I think fit to give a Caution in this case, that knowing it, it may be avoided; and this is

that which is called Washed Corn, such as grows in the middle of the Ear when the rest is smutty; and being thrashed out with the Smuttiness about it, is blackned, and so not fit for the Market till it is washed clean.

(1.) To know this from other Corn, take up a handful, and if it look clear, bright, and shining, without Change or Difference of one entire colour, then it is good Corn, and not washed.

(2.) If at the ends it looks whiter than in the middle, and the Whiteness be a darkish muddy colour, and not shining, there being a changeable colour in it, then it is Washed Corn, and not fit to be sown.

(3.) If you put a few Grains of it in your Mouth, and in chewing the Taste be sweet and pleasant, also mellow and gentle between your Teeth in the chewing, then it is not washed; but on the contrary, if it have a bitterish or flashy raw Taste, gritting or grinding hard between your Teeth with a Roughness, then it is Washed Corn, also when Corn is more than ordinary dry or moist, these are signs of Naughtiness for Seed, though not so bad as the former, shewing either imperfection in the Corn, or in the keeping of it; for good Corn ever holds an indifferent temper between Moisture and Driness: And these things ought mainly to be considered, because it is not only the loss of the Seed, but the Expences and Disappointment.

There are other things very materially to be considered; as first, The well-keeping of Corn, which is twofold, viz. in the Ear, and out of the Ear; As for the first of these, I have described in the manner of Shocking, Drying, and Stacking; and for the second, it is the most material, when it is thrashed out, and well dressed by severing it from the Chaff, Cockle, or any offensive Seeds of Weeds growing up among it; and in this and your Granaries, or other places of keeping it, must be considered to be made sundry ways, according to the Custom, or rather Nature of the Country: Some are made with Clay, some trodden with Straw and Hair, the former chopped small, and such like: But these I like not, for they soonest corrupt the Corn; for, notwithstanding

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Warmth, which is a Preserver, they however produce such Dust as produces Mites, Weavels, and other Vermin, Destroyers of Corn, so that they make it easily rot.

Others of Stone and Lime are subject to Sweating in wet Weather, and by the Moistness corrupt the Corn.

Some again are made of Lime and Brick, and these indeed are very good to prevent the coming or breeding of the Weavels, and other small Vermin; but the Sharpness of the Lime is unwholesome for all sorts of Grain.

The best then that I can advise to, for the keeping of all manner of Grain, is that made of Plaister, burnt and brought into a Mortar; so that by the working of small Stones into the midst of it, the insides and outsides may be smoothed with the Plaister, the Stones being hidden at least two fingers thick on each side, and all the bottom is proper to be plaistered, it being the best of all Flores for the keeping of Corn of any Fruit. Place these kind of Granaries as near as you can to the Air of the Fire as may be convenient, for the Plaister is very cold, yet it never dies, and so free from Moisture, that no change of the Air alters it in that particular; but it always keeps the Corn in one state of Driness and Goodness, and the warm standing of it in Winter is such a Comfort, and the natural Coldness of the Plaister in Summer, that it temporizes so well, that I can conceive nothing better for the preserving of Grain.

Where this Conveniency is not, or at least you will use Hutches, Bins, or dry Fats, and the like; they must, if for use, be made of dry or well-seasoned Oak-boards, very plainly smoothed, closely joyned, and glewed together, with Leds and Covers made very close, to prevent as much as may be the Coming in of the Air; but the principle use of these are to keep Malt in after it is dried, or Barley to be ground, or feeding Cattel.

To prevent Wheat the best way that it may be free from [illegible] frequently in seasonable Weather at the Change of the [illegible] Winnow, and Dress it as clean as you can,

ruin, then lay it in the Plaister-Lofts, or Granaries defcribed; spread it about a Foot thick at the uppermost, and so let it lye; and, at the end of four or six days at the most, turn it well with a large wooden Shovel, and it will keep sweet, sound, and good-conditioned, so that the heat, sweat, or cobwebs, cannot offend it; the Air being cooled and tempered by the opening, and the Seed dryed up by the Air, that has free access to it; and thirdly, it is refreshed by the tossing it up and down.

To preserve Rye, or Maslin, or, as some call it, Muck or Blend-Corn, being a mixture of Rye and Wheat; as for this sort of Grain, or for Rye alone, that which preserves the Wheat will preserve the Rye; for they are Grains of like nature, only the Rye is somewhat hotter and dryer, and will continue good in moister places: and therefore the Plaister-Floors, with often turning, is the properest to preserve it: It will also do well in close Hutches, or in the Pipe, or Dry-Fats; but being once opened, and the Air freely entring among it, except it be soon spent it will putrifie, or taint.

To preserve Oats after they are thrashed and dryed, put them into a close Grance, or Cask, free from moisture, and they will keep many Years: and Oat-meal is preserved the same way, though it is better fresh; if possible, have some air of the Flice: for the warmer it stands, the longer it will continue sweet and good.

As for the well-keeping of Meal, let it lye about a fortnight in the Bran before you bolt it, and then you will have near half a Peck in a Bushel more, than if you had boulted it as soon as ground; put it into dry, and well-seasoned Casks, tread it in by degrees as hard as you can, head it close from the Air, and when you take any out, let no more be taken out than what you presently use; and so it will keep well a long time; but if it has come by Sea, or in rainy damp weather, then lay it abroad on sheets, and air it, and it will keep it sweet, and a little raised, restore it.

To preserve Peafe, or Fetches, which of all other Grain are most subject to rottenness, and imperfection, because their own nature apt to breed Worms, Weavels, or [illegible] through

throw in the too much sweetness of the Kernel of the Grain; to keep them then long and good conditioned, dry them either in a Kiln, or the Sun, especially those you use for Diet, or Provinder, and lay them in Graners or Floors that are dry, and they will last sound and good a long time, and not be subject to any corruption, or breeding Insects; lay them in thick heaps, and so they will be preserved much the longer time; for if they be too much dryed in the Air, by lying thin, it takes away part of their sweetness and goodness.

Beans is another Commodity very necessary and useful in this Nation; and therefore among others, the well keeping and preserving them ought to be considered: These are more gross and fat than any I have heretofore spoken of, and by reason of the fulness of their substance, more subject to moisture, and such damp humours as corrupt them.

It is not therefore the best way to Thrash any more then what are for present use, till the middle of *March*; at which time, they having kindly sweat in the Mow, or Stack, and become dry and hard, not apt, without bad keeping, to relent again, then keep them either on plaister, or boarded Floors, or well-made earthen ones, the space of twelve days without tossing or turning; lay them as thick as you please, for being once well dryed, they will not relent; or you may put them up in Barrels, especially such as have had sweet Oyl in them, and they will make them excellent good for the use of the Kitchen, if they be close covered and kept dry, by reason of a certain mellowness that will be infused into them, and they will keep as many Years as you would have them.

To keep and preserve all small Seeds of any nature or quality soever; gather them as soon as they are ripe, in a clear Sun-shiny Day, dry and wither them in the shade, keeping the Sun and moisture from them, then bind them up in bundles without thrashing, hang them up, and keep them in their own Cods, and they will last good a full Year.

In preserving of Lentils, or Lupines; lay them together on a boarded Floor, in large, broad and flat heaps, two

Foot

Foot, or two Foot and a half thick, sprinkle them with Vinegar and Lasarpitium, and not any change of Weather, or Vermin will do them hurt, and they will keep many Years; and although these are seldom used for humane Food, yet are they very profitable for the well feeding of Horses, Swine, and other Domestick Cattle, making them sooner fat than any other ordinary Pulse; they are also physical and good for many Medicines for remedying Diseases in Cattle, and the longer they are well kept, the more is their virtue; and therefore they ought to be well esteemed among other Grain of Pulse.

CHAP. XXXV.

How the best way to plant and order Hop-Vines, to a great Encrease and Improvement of Land.

SInce Hops, (though formerly not esteemed, but accounted as a pernicious Weed) have in the latter Ages gained a general esteem, and barren Ground may be greatly improved by them, it will not be amiss to bestow one Chapter in this Book, in directions how they ought to be ordered and improved to the best advantage.

Consider then, that this Plant is very tender, and will not thrive to any advantage on too rich, or too poor Ground; for in the first they grow up to rankness, bringing forth only Leaves and no Bells; in the second, very few Leaves or Bells, dwindling and coming to nothing.

If you have no other convenience but the first, you must allay the fatness of your Hills by mixing Chalk with the Mould; or small Gravel, if it be fatty, or mixed Mould, and if it be stiff Clay, then with good store of red Sand; for any of these, in a little time, will alter very fitly.

But if the Soil be not of either of these, but extream barren, then observe whether it lies high or low, or by any means subject to overflowings; if they be given, then it is unfit for Hop-Grounds; but moderate flowings [illegible]

be averted by ſmall Drains made through the Alleys, when the banks and hills are raiſed, convey the Water unto the lower Grounds, whereby it may not continue long, to ſoak and hurt the roots of the Plants; and where your neceſſity obliges you to chuſe ſuch Ground, you muſt raiſe your hills a great deal bigger and higher, that the overflowings, when they accidentally happen, may not exceed, in their riſing, above the middle of the Hill, and ſo not ſend much wetneſs to the Root; and the Water not ſtaying in the Alleys, but taking a ſwift current and draining through the Alleys will bring much fertility to the Land; but when you have eaſed your Land of theſe particular faults, the general one is Barrenneſs, and this is alſo to be removed, that it may be brought into a good and ſuitable temper; and therefore about *Michaelmas*, having caſt up your Hills, and made your Alleys ſuitable, of four or five Foot breadth between hill and hill, not letting the hills ſtand directly behind one another; for ſo one overſhading another, which is a great annoyance; but it may be done according to this Figure, where there is a ſufficient largeneſs of place, and ſuch a convenient paſſage, through which the Sun may come, at all convenient times, to refreſh the Plants, and make them proſper well.

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The Ground being free from Water, it may be raiſed about two Foot and a half, and the compaſs anſwerable, neither too big nor too little, but ſhaped like a Sugar-loaf; yet ſo on the top, that the hill may be flat a little, to retain the Rain, or the thick Dews that falls upon it moderately, but ſhoot off the great abundance.

Make not the hills intirely of one Mould, but a third, or better of ſuch Earth as you ſhall dig up under Dung-hills, and a little Soap-aſhes drained from the Lye, and by mixing them together compound your Hop-hills; but if theſe are difficult to be got, ſufficient for your purpoſe, then a third part of theſe, and two parts of natural Earth may be ſufficient for your purpoſe, though the firſt is better; however it muſt then be renewed in three or four Years, or the ſtrength of it will be loſt: When your hills

are

are made, pare up the green Swarth in the Alleys, about four fingers thick, and with it cover the outside of your hills almost to the top, turning the Grass-side next to the Earth of the hills, that rotting there, it may add to the manuring and and keeping them very warm; let there be so much space on the top of the hills as may contain the Plants, and the Poles that support them; only then, if the conveniency of getting it admit, take dryed Fern and spread it in the Alleys of a pretty thickness, so that rotting in the Winter, it will much comfort the Hill, and be good Manure against the Spring, which being then cast about them, will very much strengthen them, and make the Plants prosper.

The Hills being thus manured and cast up, open them at the top with a Setting-staff; crumble good Mould in, to lye loose at the bottom, and then put in the best Hop-Plants you can get, in every Hill, at the least four, being well prepared; putting them deep in the Earth, and covering them all over, at least four fingers thick; and if the Earth you cover them withal be mixed with Ox-blood, and a little slacked Lime, it will not only give much comfort to them, but preserve the roots from Worms and other Vermin.

Your Hop-ground being thus fitted, and planted in the Month *October*, which I account the best Season, let it rest till *April*; and when the Vines of your Hops come out of the Ground to a pretty length, then set up your Poles long and straight, of any convenient wholsome Wood; and in doing it, observe that in putting them into the Ground, and fastening them, you do not hurt the roots of the Hops; and when they are put into a depth, that they may stand firm, ram the Earth hard about them; and in the next place observe they are planted at that distance, that the Sun-beams may easily come in between them, and there be no overshadowing; this by a little practice may be perfected, and turn to great advantage: As for the number of Poles to be placed on every Hill, they must be answerable to the Vines that spring up; and you must twine the tendrills about them, so that growing up, they may of themselves wind and take fast hold, not leaving

any

any to creep on the Ground, for they turn to no advantage.

As for weeding Hop-grounds thus manured, there is little occasion for it, by reason the manure will destroy the Weeds; but if in despight of this any sprout, to annoy the tender scions, you must cut them, or pull them up by the roots, as in other weedings; and with this care, barren Ground will yield a vast advantage: However, before I end this Subject, it will be proper to tell you how to preserve them from Vermin as well when they are grown up also.

CHAP. XXXVI.

How to order Hop-Vines, gather and dry the Hops after the best manner, &c.

If when the Vines rise on the Poles, any of them happen to break loose, you must twist them again towards the Sun-rising as much as may be, and those that mount above the Poles are accounted for the best; and if you perceive the Flies, or any other Insects to bite and afflict them, sprinkle the Vines with Water wherein Wormwood has been well boiled, and it will preserve them: In excessive hot weather, water the Hills about Sun-set, and continue it, if no Rain fall, till they Blow, which will be about St. *Margaret*'s day, and at *Lamas-tide* they Bell.

When you observe them to turn colour, some sooner than the other, pull them though they be not ripe, lest they shed and come to nothing, as having met with some blast, or other defect; but when they naturally do so, and in full Season are ready to pull, make a plain place in your Hop-ground, as near to the Hills as conveniency will permit, then cut the Vines close to the bottom of the Poles, bring them away, Poles and all, by cutting of the intanglements one with another with a hooked Knife at the

end of a long Pole, and lay them down in order for those that are to gather them, to pick off the Bell, which must be done with much celerity, not suffering them to ly long unpulled, either in Rain or Sun-shine.

During the gathering, prepare your Kiln, heated with Straw, or small dry Wood, and spread them on it in such good order, that they may easily dry, which you may know by their bitterness, or crumbling between your Hands; however never permit them to continue on the Kiln more then twelve hours, and keep hot your Kiln night and day, till your whole gathering is dryed, and, taking them thence, let them lye on a Floor a Day or two, to give, before they are sacked, or bagged up, or else they will shed their Seed, wherein the greatest virtue lyes, and also the Leaves be apt to crumble and break off.

The Vines being cut away bare, and the Roots to the middle laid open, shake a little Mould mixed with Horse-dung, and let them continue so all the Winter; and in so ordering, an Acre in a Year that hits, which is certainly every third, will yield 1200 weight of Hops, and treble the charge you are at.

CHAP. XXXVII.

Flax and Hemp, good Improvers of Land. How to Manure the Ground for them, Sow, and Order them.

THere is great Improvement to be made on barren Land, by manuring it proper for the well-growing of Flax and Hemp, Commodities so useful and very profitable to this Nation: And for these you must, however, choose proper Grounds; for there are two sorts that naturally refuse to bear these, viz. The rich, stiff, black, tough, and solid, fat Mould, whose extraordinary fertility, gives such an overplus of surcharge to the Seeds increase, that either, through rankness, it runneth all into Bun, and be-

little or no Rind, or else the Seed being tender, the Sod and heavineſs of the Mould buries it, that it labours in vain to get out.

The other oppoſite to it, is the moſt extream barren Ground, which will not bear this, nor any good Seed; and of theſe I propoſe to treat, for ſuch as will naturally bear them, I need not ſpend time upon.

As for the firſt of theſe then, though it is very good for Corn, yet for Hemp and Flax, it muſt be reduced; and to begin to do it, plough it up with a ſtrong Plough, fit for ſuch Ground; and about the middle of *May*, if the weather be ſeaſonable, and the Ground not too hard, ſow the Seed: If it be hard, you muſt wait for ſome gentle Showers, ſo that the Earth being mollified, then hack it after ploughing, and break the Clods in ſmall pieces, then if you can get any ſalt Sea-ſand, ſand it plentifully over; but for want of that, ſand it with the beſt red Sand you can get; and upon every Acre ſo ſanded, ſow three Buſhels of Bay-ſalt, then plough it again, to mix well the Sand and Salt together; and this laſt ploughing is proper a little after *Michaelmas*, and then let it reſt till Seed-time; and then ploughing and hacking over the Ground, ſow it either with Hemp or Flax, as you think is moſt for your advantage; harrow it well into a fine Mould, and clot it with a Clotting-beetle; then, after the fall of the firſt great Shower, run it over with the backs of your Harrows, laying an indifferent weight upon them, to keep them cloſe to the Ground, that they may break the ſmall Clumpers, and ſmooth the Earth. If it be ſown with Hemp, it need not be weeded at all, becauſe this will out ſtrip and choak them; but if with Flax, or Line, being a much tenderer Seed, bringing forth many more tender leaves and branches, then obſerve how the Weeds ſpring up, and pluck them away till the Flax is well ſprung, and then it will conquer them, and not be overgrown by them.

As for the worſt ſort of Ground, you ſhall dreſs it as you do the clayey barren Ground, I have mentioned Chap. ..... beginning at the time of the Year there appointed; or indeed, if urgent occaſions detain you from it, you may plough it up about *Michael mas*, and ſo let it reſt

rest till *March*; and that being the proper Seed-time, plough it again, and manure it as the Clay-ground; hack it, and if the Earth be rough and stiff, harrow it before you sow it; that the Earth may be small, and as level as possible, breaking the Clots, if any remain, with your Clotting beetle; then, after the first showers have well moistened it, go over it with an even, but very weighty Rowler, treading the Ground as little as may be, and the swifter it is drawn the better it will crumble the Ground under it.

As for Weeds here, you need not much trouble yourself, for the Earth purposely thus ordered, is an enemy to them, and will not put forth any; nor shall you have any trouble in dressing it above once in eight or ten Years, not plough it after the first Year, but at Seed-times. If you can get with Drags, or Engines, the broad, black-leaved Sea-weed, called *Ore-weed*, growing in great tufts, abundantly about the Sea-shore, cover the Land with them, and so plough them in, as they may be buried to rot in the Earth, and they will be excellent Manure, giving much strength and heart to the Ground.

CHAP. XXXVIII.

To order Hemp and Flax, when Ripe, in many respects, to the best advantage.

HAving thus treated on Hemp and Flax, as to the Sowing it to profit and advantage, not to omit my former method, I have thought fit to speak something briefly as to the ordering it when ripe, and gathered, as to the manner of rendering it useful.

Flax, when grown up to ripeness, is known by the yellowness and swelling of the Seeds on the top, at which time gather it, and bind it in little bundles, setting it in the Sun to dry, that the Seeds may fall out into a convenient place to gather up; and keep them for use, &c.

Either

Either for Sowing, feeding Birds, making of Medicines, Oyl, &c. And if they fall not out ſpontaniouſly, you muſt rake them out with an Iron Hatchel, or by beating with a Pole, Carding, or the like.

When you have done this, and the bundles are well dryed, lay them in Water, and keep them from floating, by preſſing them down with weights, and when you perceive the wet has made the Rind very looſe, conclude them to be ſteeped enough; then take them out, unbind the bundles, and dry them in the Sun again, then peel of the Rind, and hatchel it on an Iron Hatchel faſtened to a Block with many long Iron Teeth, and beat the Stalks till they become looſe and pliant, ſo that they may in dreſſing, be drawn out into fine ſhort threads, and dreſs them as the Rind, though upon finer Combs, or Hatchels; having for this purpoſe ſeveral degrees of them, as to fineneſs, anointing the Spikes, or Teeth, with Oyl, that they may ſlip the glibber; and ſo you may bring it fit for uſe in making Linnen-Cloth, &c.

Of Hemp there are two ſorts, Male and Female, the firſt bears no Flower, but a Seed of divers Colours; the latter bears a Flower, the Stalk is full of knots, out of which, proceed many branches, ſharp, jagged, or indented; the Roots of this deſcends into the Ground a very conſiderable depth, and therefore it requires deeper ploughing than the former, it growing very faſt, and a prodigious height, in ſome Countries twenty or thirty Foot, and by reaſon of the dryneſs of its nature, requires Water at the Roots, or to be Sowed in ſomewhat a moiſt Ground, proſpering the better, the thicker it is ſown, and may be ordered and dreſſed, in all reſpects, like Flax; being very ſerviceable to the Nation.

CHAP.

CHAP. XXXIX.

How to plant and order Saffron for the improvement of Land, &c.

SAffron is not the leaſt to be conſidered for the improvement of Ground, and is of excellent uſe in Medicines for comforting the Heart, and expelling all ill Vapours that have Death for their attendants, if not timely removed; and therefore, if for no other reaſon, it ought to be planted, cherished and improved: but there are others, for it brings great profit to the induſtrious Husband-man, greatly recompencing his labour, if care be taken about it, as thoſe in *Suffolk*, *Eſſex*, and *Cambridge-ſhire*, where it grows in abundance, experimentally find.

It will grow upon indifferent Ground, with little manuring, if it be not ſtiff Clay, too cold or wet, but rather a compound, moſtly inclining to red Sand, and ſomewhat Stony, though a fine mellow Mould produces it better; plough this well, and make the Mould ſmall with the going over of Harrows, and beating the Clumpers; lay the Lands high, as for Wheat, with convenient ridges; then with an Iron Inſtrument like a Hoe, with a twelve or fourteen Inch'd broad Bit, draw the Furrows long-ways, pretty deep, place your Roots, or Sets in them, (for from the Seeds no advantage ariſes, unleſs they are ſtraw (planted) let them be placed about two Inches one from other, and ſet about three Inches deep; then draw another Furrow ſo near, that the Mould turned out of it may cover the former Roots, and ſo one after another, till the whole be effected to your deſire, but the laſt, into which you muſt draw what Mould comes next. The proper time of ſetting them, is the latter end of *June*, or beginning of *July*, leaving ranges, or ſpaces between the Furrows, that a ſmall Hoe may paſs to take away the Weeds. All Winter they will appear green, like Sives, but in the

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Summer, soon after the Flower decays, it appears to dry or wither.

In *September*, the Flowers being blew and lovely to behold, come up without any green leaves, or spires, and in the middle of each Flower you will find two, three, or four blades of Saffron standing upright, and at the same time the Flower spreads itself; and when you perceive them thus to put out, draw them forth between your Finger and Thumb, and put them into a thick, clean Linen-bag, the better to preserve the scent; do this every morning, or otherways it will return into the Flower, or Earth, and you cannot, with any conveniency, come at it till the next morning; and this you may do for a Month together, the Flowers continually increasing, and therefore the number of your Saffron-pickers must be according to the quantity of your Crop, that it be gathered with expedition; no time but the morning being proper to do it in.

Saffron will grow to bear two successive Crops, but no more; for then you must transplant the younger Roots, and lay the elder aside, as useless. These Roots are commonly sold by the Bushel, and two Bushel of good ones will sufficiently furnish an Acre of Land so ordered as directed.

The Season for taking it up, is the beginning of *July*, or you may do it the latter end of *June*, if you see occasion. To dry Saffron, when gathered, you must make a Kiln of Clay, not quite half so large as a Bee-hive, though in form like it, with small Sticks laid over; and it must be tended with a moderate Charcole-fire, turned, and ordered, so that that it may dry well in every part: and to know when it is sufficiently dryed, reduce three pound, as it grows wet or moist, to one when dryed, and it is sufficiently ordered; and of a good Acre you may expect fifteen pound of well dryed and good conditioned Saffron; though two pound, at the rate it goes, will much overballance your charge and labour.

CHAP.

CHAP. XI.

Claver, or Clover-grass, how in the best manner to order the Seed, Sow and Increase it, for the improvement of Land.

THere are several sorts of Claver, called vulgarly, Clover-grass, from whence great advantage springs to the improvement of barren Land; it being my intent to encourage the industrious Husbandman in every thing that is convenient for improvement of this nature.

As for the Land proper for the increase of this, I hold that best, that is dry and warm; for though it be cold, yet with a little Manure, it will produce excellent Grass of this kind: Land that has been sowed so often with Corn that it will well bear it no longer without new dressing, will, nevertheless, serve this turn, especially earthy, well mixed Land, of a middle temper, with a little improvement, is excellent for it; You, for this, may manure it with Dung, Marl, Lime, or Chalk beaten small; and lastly, your natural cold Land so ordered, will turn to good improvement, if it be well drained to prevent overflowings, or the Water lying long upon it; and indeed, most sorts of Land well ordered, produce it, though some more in abundance than others.

And this I shall lay down for a general Rule, That the Land which is not too rank, or fat, for any sort of Corn, is not too good for this sort of Grass; but barren Land without improvement by manuring, will not produce to answer expectation: as for the ploughing, use it as directed for Fetches and Pulse, Chap. ...

As for the great Claver, which is the best, the Seed is like that of Mustard-seed, but not so round, but inclining somewhat to an oblong: The choicest of this is of a greenish yellow colour, some a little reddish, but the black is not so good; and therefore in the choice of

Seed have a great care, for that is the main of the business to answer your cost and industry; and of this Seed we have good among ourselves; many is brought from *Holland*, where that by their Kiln-drying of it, and the Sea, in bringing it over, it many times, taking Salt-water, deceives the expectation of the Buyer, and answers little of the charge; to get it out of the Husk, which is somewhat difficult by thrashing or beating, it may be milled out with Stones, not too sharp, and hanging at a proper distance, that they may bruise the Husks but not the Seeds; yet, since it is to be had ready taken out, I shall not trouble the honest Country-man about this particular, for, if he has none of his own he must buy it, and try a little of it, wherein he may see how it will spring up, that you may not be frustrated in your Labour and Expence; a Gallon or twelve Quarts, is sufficient to Sow an Acre well, if it be highly contributed, and if you Sow some of the Chaff of the Husk with it, it will thrive the better; and, that it may fall the more the better, to spread, mix with it some fine Earth, or fine Ashes, that the Wind may not scatter away more to one place than to another, for it being so very small, you cannot see how it lies on the Land, to know whether it be equally distributed; then again, it will not, as Corn, be seen even by the thrasher; when it is not so, it must be sowed then in calm Weather, that the Wind may not have power to drive it, but that it may fall incidiately to the Ground: You may Sow Barley, or Oats with it, and the first Year it will not grow up so far as to hinder them; but then they must not be sowed so thick as in other cases, and when they are harrowed in, and this Seed sowed, with a gentle harrowing, or the drawing over of White-Thorn Bushes, will sufficiently cover it, and it will last on the Ground many Years: The best time to sow it, is the end of *March*, or the beginning of *April*, if it be likely to be a dry Season; late sowing may do in a fruitful Season, but early is most certain; and in this manner, on Ground where it takes, it will bear three Crops, two to Mow and one to Graze, the first by mid-*May*, the second about the end of *August*, and then by the beginning of *October* will be grown up for Grazing, which you may continue till

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till Summer; it is best cut moderately green, when its Sap is in the Stalk and Leaf, and then, being well dri[ed] ruminates it the sweeter and most nourishing, unless [you] keep it for Seed alone, and then it must grow up to [its] full growth, and be very dry, but then Stalks are good [for] little more than Fuel; however, the Seed, if well got [up] will recompence the charge.

It is a very good feeder of Cattle, increasing Milk [in] time, and fattens Oxen above any other Grass, as [to] of a fat, sweet, and luscious nourishment; and sow a [Bu] Acre the second Year's growth for Mowing, and Fro[st] will return you the advantage of twelve Pounds, whi[ch] sufficient profit, seeing it will grow upon Grounds of [no] Plantings an Acre, or under, very well, and last [for] forty five Years, with a little manure; and one adv[an]tage is in it, that when it dwindles it prepares the L[and] for Corn, so that one under another it comes to great p[ro]fit.

CHAP. XLI.

St. Foin, or French-Grass; Directions for Sowing, Ordering and Improving it on Land.

THere is another kind of this sort of Grass that [may] to good advantage, and that is St. Foin, origin[ally] a French Grass, so far as I can gather by the first Impro[ve]ment of it, sowed then upon dry husky Lands, and somet[imes] in their Gardens; it yields to Cattle, that feed on it, [an] dance of Milk, and will grow and prosper in any [dry] hilly Land, though it thrives better upon Land that is [well] derately manured with Dung, Marl, or Chalk; and [when] it has grown seven Years, the Root so spreads, that [after] ing ploughed in, it becomes excellent Manure to pr[epare] the Land for Corn.

The Seed of it is mostly like a Parsnip-seed, only [it is] browner, rounder, and fuller; you must, by reason [of its]

ser, sow more in quantity than that of Clover, for the
ller the Seed is the further it spreads in the Ground,
half a Pound and a half of this, or somewhat more, will
go further than a Pound of the other, for the thicker
closer it grows, the better it stocks the Ground.
The manner of sowing it may be with Barley, or Oats,
being mowed with them, may be cied as good seed,
the separating I hold the best; it may, the first sow-
be mowed the latter end of the Year, and so prefer-
for a good Crop five or six Years after, and then the
it decaying, the common Grass will overcome it, and
that time it has prepared the Earth fit for Corn a-

There is also another Grass, by the *Welsh*, called the
-wem, which is exceeding good Fodder, and this will
grow on dry and barren Lands, but this is not very
mon, nor has any considerable improvement been
e of it in this Kingdom; however, it may be proper
barren Lands of little value for any thing else, and an
eriment would not be amiss to improve it; for, by
stry, through the blessing of God, all the Improve-
ts we have, have been brought to pass to the enrich-
and plentifully feeding the Nation, whilst Sloth would
brought Poverty and Want.

CHAP. XLII.

Improvement of Land, by Sowing and Well-ordering Turnips.

Turnips are a great Improvement of Land; for, be-
des the advantage they yield in selling, for the
, and the feeding Cattle and Swine, the Roots and
may be brought to rot on the Ground, and become
Manure; besides, they hinder not the first Crop,
ally of Peas, Beans, or Barley, but being sown
they are taken off, grow and flourish in the Win-

ter, and are properly drawn before Barley, or Oats Se
time, though you may sow two Crops, the early, and
later. The Seed being small may for the better
more even spreading of it, be mixed with fine Mo
or to prevent the Birds, or Worms eating it in the Gro
with Wood-ashes; they require, if the Ground has
well broke up, but a light plowing, but to be well
rowed, that the Birds destroy not the Seed, which if
perceive to have been done, by the barrenness of
place more than another when they come up, you
sow that again, and there will be little difference in
coming to perfection. They delight in, and prosper
in a mellow Ground, or a mixture of Sand and Cl
black Mould is exceeding good to produce them, for
Ground be hard their roots will not spread, or co
their full natural perfection.

Of these very useful Roots there are two sorts, bo
one kind, that is, the round, or bulbous, and the
Parsnip Turnip, but the first is the most numerous a
soaleth sown in Fields.

When you have sowed and harrowed the Seed, b
the Land as even and level as may be, go over it w
Rowler of weighty Wood to press it in and break t
maining Clods, that the growing Seed may the ea
through it, and when they are pretty well come u
the leaves begin to spread, they must be diligently
over, and the underlings culled out, by cutting the
even with the Ground, or somewhat lower, that the p
cipal Plants may receive the Sun and Air, more free
thrive the better; and, when they are grown larger, if
appear too thick, they must have a second hoing,
then the tops will spring up amain, and the roots
more Earth to spread in. If you find a black sor
Caterpillar to light on them when they come u
green, or grow a little height, which spyson and
their leaves, by that means hindering their gr
you cannot flow them for a time with Water to
these Insects, go over them with a great heavy
Rowler, taking care that the Horse, with his Feet,
fer as may be, and the weight of this Rowler bea

hard to the Ground, will crush the insects to death: if this be done in a dry time, when they are in their inner most Joynted, the rops with the heat of the Sun a little sprinkling of Rain, will rise again, and flourish than ever.

To preserve the best Seed for the next Year's sowing, a considerable number of the fairest and largest Turnips, free from Worm-eaten, Stringyness, rough-Rinds, warts, and transplant them to a good Soil when they are growing to Seed, covering them pretty high with Earth, that is, about four Inches above the Root, setting a Foot and a half distance, and water them a little, if the Weather be very dry, and so let them run to Seed; cut of the Stalks when the Seeds loosen and begins to fall in the Pods, and having well dryed them in the Sun, beat them into a large Hop-sack, and by beating them with Staves that the Seed will come out, which you may sift, and winnow from the Husks, and lay it up in a moderate place for your next Year's use, ordering it as before, ordering in all particulars, where required, as directed; and you will have sufficient stores for your self, plenty for your Cattle, and the like for the Market, if you live near any good Towns; this being a very wholsom, moist, strong, and nourishing Root, good against Feavers and other Diseases, Mayning the Acrimony of the Bloods.

CHAP. XLIII.

Improvement of Land by Sowing of Carrots, and how to well order them, &c.

Carrots are very wholsom nourishing Roots, and by them Land may be much improved, but in every Land they will not prosper, as mostly delighting in warm Ground, mixed with a moderate fruitful light Land, and if you sow them in any other it must be well dunged and manured, but where you find a natural light

and warm Ground, if it be but indifferently fertil, they will, however, thrive therein; you may sow them in intervals between Beans or Peas, laid in Furrows, and reap two advantages with a little more labour and cost, one not hindering the other, for as much as the Corn are ready to draw, the others will be taken off the Ground, and though in doing it, some of the tops may be bruised in trampling, they will recover, and spring up again.

The Land there are sowed in should be rather digged than ploughed, or if the latter, it must be very deep, to give the Roots leave to grow to a full length and bigness.

When you have sowed the Seed about the middle of *March*, or much sooner, if the Weather be open, you may if you sow them between any rows of other Seed, cover them in with an Iron-rake, so that they may be very lightly covered, and they must lye dry, for too much wet or moisture perishes the Seed or Roots; for, though the Seed be hot and requires some moisture, yet a great deal dampe its natural heat, and kills it; you may sow them to save the trouble of hoeing, but if they come up very thick, contrary to your expectation, they must be hoed; they also require weeding till the tops meet, the Weeds, and then they will of themselves destroy them.

The best sort of these are the deepest yellow, or orange, the pale yellow are fit only for the Summer Season, not apt to grow to any bigness, as the others; if the Ground be sterril you must manure it ere you sow the Seed. Sand you may well keep them all the Winter, for your Table, and to fatten Swine.

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CHAP. XLIV.

Improvement of Land by Sowing of Parsnips, and the well-ordering them.

PArsnips are a good improvement, where they will kindly grow, and come up to a proportionable bigness; they are a Root of a luscious, oyley taste, wholsom, and extraordinary fattening.

The Seed of this is proper to be sown in the Spring, and is much delighted in rich mellow Ground, which must be digged deep, that the Root may the easier shoot downward and grow thick to full proportion; many Fields, with a little manuring, will produce of these a great encrease, and turn Land to a wonderful advantage, where there is good Sale for them, over and above the Food that will fatten Swine, and as much as will [illegible] the Family; when they are grown to any bigness you may turn Cattle into the Field, whose browzing on, and treading down the tops, will make the Roots prosper the better.

This Seed must be sown deep as can be, well raked in; they require little moisture, and therefore may be sown on raised Lands, like Beds, and being taken up with a large Spade, that is, in length, they may as soon as cleansed from the Earth be set to Sale, or else you may keep them a long time in good dry Sand, cutting off their tops to prevent their growing.

Another useful thing that may make good improvement, though not in such a general manner, are Potatoes; these being once in the Ground will spread extreamly, and if a Root be cut in many pieces it will every part of it grow; they are very nourishing and wholsom to the Stomach, and a little piece of any ordinary Ground will produce a sufficiency for the use of many Families a whole Winter, and many succeeding Winters, their encrease being

ing very great; but you must not sow them in Stony Ground, for that will much hinder their growth, and make them wrinkled and ill-favoured.

CHAP. XLV.

Improvement of Land by Sowing Weld, or Woold, and how to order it.

THere are other Improvements, though not so common, that make good returns of Land and Labour, which (designing to Write a perfect Book of this nature) I think not convenient to omit; and first of Weld, or Would, a rich and profitable Commodity for Dying; it beareth a long, narrow, greenish, yellow Leaf, and produces a yellow Flower, running to a small Seed, and is very thick set with them, smaller than a Mustard-seed; it flourishes in *June* and *July*, growing in some places of its self, and is produced on very indifferent Land, hardly fit for any thing else without much manuring, so it be very dry and warm by nature.

It costs but little the managing, as requiring no Tillage, it being to be sowed when and where you sow your Barley and Oats, upon that Husbandrys without any additional drawing a few Bushes with weights over it, or pressing it into the Earth with a Rowler; sow it even, for the Seed being small will require skill in this, therefore mix Ashes or fine Earth with it, that it may spread the better when well mingled with either of them.

A Gallion of this Seed is sufficient to sow an Acre, adding, for the better spreading, two Gallons of Earth or Ashes to every Quart; stir the Composition often to keep it, lest the Seed sink to the bottom, and so deceive you; cast it out at arm's end in as even a compass as possible; in the Summer you will receive a good Crop, and when it comes to ripening, be curious in observing it, for if you let it grow too long the Seed will fall out; if not long

now

rough; neither that nor the Stalk will be perfect; and therefore note both the ripening of the Seed and the turning the Stalks; and when you perceive it properly ripened, pull it up by the roots, bind it in little bundles, placing them in little shocks, that the Sun and Air may freely penetrate every corner, and in any case be sure not roughly to use it, lest the Seed fall out; and by this well ordered, there is considerable profit to be gained, as ten times the charge and price of the Land, if it comes to a good Market.

The Seed may be thrashed out with small Poles, or Wands, on a clean boarded Floar, so close joynted that they cannot run into the crevices, which may be reserved for sowing again; it colours a bright yellow and a lemon-Colour excellently well, and with the Stalk the Root must go, being of the same efficacy, and a great dye it is, that it is not more improved, since it may improve many sorts of Land that lies in a manner altogether unfe-

CHAP. XLVI.

Improvement of Land by Sowing of Woad, and how to order it, &c.

WOad is another useful and very profitable Commodity, having a fair foundation and solidity of very good Colour, and a Woad-red Colour is free from staining, excellent for holding any colour, and almost every sad holding Colour must be Woad, therefore it consequently is of great use and advantage in Dying. The Stalk is small and tender, the leaves of a blue green Colour, the Seeds is like to the Ash-keys, or Seed, but not so long, the little blackish Tongues, the Root simple and white, it bears a yellow Flower.

This contrary to the other, requires very rich Land, that is warm and sound, either a little Sandy or Gravelish

will do, though the [illegible] Land exceeding rich, though it should be mixed with a little Clay, it [illegible] Pasture, [illegible] with the [illegible] equal Goodness [illegible] acre sooner, and better [illegible] parts of this Kingdom for [illegible] *Oxford-shire*, *Northampton-shire* and *Warwick-shire*, *Oxford-shire*, *Northampton-shire*, *Glocester-shire*, *Leicester-shire*, and *Buckingham-shire*, with some other places.

The Ground for this must be exactly ploughed, and [illegible] very [illegible] they may lye [illegible] wet and fair [illegible] with Harrows [illegible] Acre, which [illegible] Stones and [illegible] fine, and break all the Clots [illegible] the Stones and [illegible] bed of the Ground, that it may [illegible] eatily up; the proper time of sowing is in the middle, or towards the end of March.

After the [illegible] soon as any Weeds [illegible] from time to time [illegible] when the Leaf is come to full growth, which will be [illegible] must forbear, and [illegible] the Leaf produces, [illegible] and carry it to the Mills to be ground, and when it is [illegible] make it up in little Rolls, and dry them well for use: A [illegible] good Wood, in a [illegible] five or six Crops, [illegible] Winter Crop is exceeding [illegible] the Rot and many other [illegible] the Opinion of some, prepare the Ground very well [illegible] Corn, and good Lands have been gotten by it: The [illegible] Weed has been [illegible] twenty or thirty Pound a [illegible]

CHAP.

CHAP. XLVII.

Improvement of Land by sowing Madder, and how to order it.

MAdder is a very good improver of Land, and is much used in Dying, there is but one kind of it, which is manured and set for use, but there are many things like it, as Goose-grass, soft Clivet, Crosswort, Lady's Bedstraw, &c. which have all Leaves like Madder, and are supposed to be a wild kind of it; it has long Stalks and trailing Branches on the Ground, rough and full of joynts, and every joynt set with green rough Leaves, in the manner of a Star; the Flowers grow on the top of the branch, of a faint yellow Colour, after which, comes the Seed round and green; the Root creeps far in the upper crust of the Earth, one Root entangling into another, and when it is green and fresh the Root is of a reddish Colour, small and tender; and although it bears a Seed, yet in this Country it comes not to perfection, and therefore it must be planted from the Sets that are to be gotten from the Madder; and the Season of getting, or drawing them is *March* and *April*, as soon as they are sprung out of the ground about three Inches, every Sucker having some Tufts of Roots growing from it, being slipt from the main Root; as soon as you have drawn them, put them into a convenient Basket with some fine Mold, and hasten them to the Ground where they are to be set, for the sooner they are set the better they prosper.

The Ground they best thrive in, must be very rich, warm and a deep Soil, digged two Spades graff, and two Shovelings also; and when it is raked and laied very even, then draw very streight Lines, or Furrows, trod out in long Beds about four Foot broad, from one end of your work unto the other, set them about one Foot asunder every way, and if it be a dry Spring they must be kept wa-

watering till they recover their fading wan Complexion.

You may begin to dig your Ground in the beginning of Winter, and so all along, to the time of setting, weed it and hoe it till it have got the mastery of the Weeds, and then it will destroy them: Set them by a Line for a good evenness with a Setting-stick, crumbling in light Mold to fill up the vacancy, and if any die you must fill up the vacancy, for they come not to their natural perfection under three Years, and the first and second Year keep them hoing, and you may gather Sets from them almost as many as you have set, for the Root will bear it, by taking firmness in the Ground, and well spreading; so that these Sets will in the mean time supply other Grounds.

CHAP. XLVIII.

Wood-land and Inclosures Improved, and the great Advantage made thereby.

INclosures and Wood-land are of great advantage to the Husbandman, not only in supplying him with Timber for his own use in Building and Sale, but with Underwood for Hedging, Fuel and the like, for himself and Neighbours, to encrease Enclosures and pass away the bitter cold of the Winter with keeping good Fires; besides Trees may be planted, and will flourish in places where Corn, or Grass, or any other profitable thing will not kindly grow; besides when the Lands are cleared of Woods they prove much better, and yield greater plenty of Corn, with a little Manure, than many that have been long tilled lying round about them; they also yield pleasant and delightful prospects to the Eye, serve as cool shades to retreat in in the Summer, and in the Winter prove shelters to the Houses, Barns and Lands lying near them, from the cold nipping Winds; and in Woods, by their warmness, Grass in the vacant places springs all the Year,

Year, on which Sheep will feed well and grow fat, being by that means preserved from the cold and rot; likewise well grown Woods, in most places, produce Mast, Holm, Acrons, Hazle-nuts, Services, Medlers and the like; which, either falling of themselves, or being diligently beaten down, feed a great number of Swine to a considerable fatness.

Lands of small value may be, by planting of Trees, brought to grow up to considerable Estates; I find it confirmed by several, that Land not computed to be worth ten Shillings an Acre *per Annum*, has by this manner of improvement produced, at eleven or twelve Years growth, as much Wood as was fell'd from one Acre 60 *l.* And indeed, Moriih Boggy-lands, that cannot be drained, or otherways improved to any profit or advantage, being planted with Oziers, Willows, Alder, Poplar, or the like Trees, that affect and covet most Ground, return in a little time to a great advantage for many uses, growing very fast, so that they turn to great advantage. It has been known that a hundred Ashes, at the growth of fifty Years, have been sold for 500 *l.* and these growing too on a very small compass of Land, which they but little incumbred; and I find it set down, that a person planted so much Wood that, in his own life time, was valued at 50000 *l.*

These great incomes and encreases, methinks, should give many incouragement to imitate our Predecessors, that as we find the advantage of their labours and industry, so Ourselves and our Posterity may find the like of our own; and for the better, quicker, and least chargeable improvement of these things, I shall lay down plain and easie Rules.

CHAP.

CHAP. XLIX.

Of Oak, Elm, and Beech, how to Order and Improve them for the best advantage.

As for the *English* Oak, among others, for firmness and durableness, it is counted the best Timber in the World for building Houses, Shipping, and other necessary uses, and yet it will grow on any indifferent Land, good or bad, as Clay, Gravel, Sand, mixed, or unmixed Soils, dry, cold, warm or moist, but they most affect, and best prosper in the sound, black, deep Mold, a little rising, rather warm than over moist and cold, for this produces the firmest and best Timber, though they will thrive very well in cold, moist Clay-grounds; they will also grow, though but slowly, on high, stony, and barren Hills, some sow Acorns in their Nurseries, when they are ripe, but not dried, and these produce store of young Plants in the Spring, if sowed in Autumn, which may be removed the next Year, and planted in forms for Groves, Woods, or Lawns; but I hold the Slips and Plants got from the roots of Oaks thriving, and of a moderate age, are better, and will much sooner come to perfection, if planted and fenced from the brouzing of Cattle, the nipping northern Wind, whose unreasonable cold in Winter does much hurt to young Plants; and if any of your Plants be crooked, or ill-shapen, cut those near to the Ground, when you set them, and other Shoots will spring up from them, that will grow straight, and become very aspiring in time: Oaks likewise prosper very well in Copices, especially to be felled as Under-wood; beside the Wood of these Trees for various uses, the Bark is of good value, and for Tanners and Dyers use, not to be omitted; nay, the Saw-dust and Ashes are of value; so that there is no loss in any part of it, that is not proper for some use or other;

other; in Charcoal it is the best of all Wood, and endures wet and dry to a long continuance.

The next of use to this in *England* is the Elm, chiefly planted in Hedge-rows, casting a good shade against the scorching of the Sun, and proving a notable shelter against the Winds, growing much faster than the Oak; it grows well in most Grounds that are not hot, dry, and parching, Chalk, Gravel, and shallow Lands, for in them its large spreading Roots cannot well enter, and it requiring much Sap will not otherwise thrive, or come to any stateliness of perfection; It delights mostly in light, level, and loose Land that is moist, and on the Banks of such levels as are wet Ground. The Seeds of the Elm, as they are termed, which put out before the Leaves, in open weather, fall about the beginning of *March*, which some hold, being sown in a Nursery, will yield store of young Plants; but I like those better that spring out of the Ground from the spreading Roots, that lye shallow some distance from the Tree, a great many of which may be easily taken up with Spurs, and some part of the main Root upon them, and these are called Suckers, being, at the proper seasons, to be had in abundance, and these you may transplant into any place where it is proper for Elms to grow.

Take no those Suckers that have been blown, or bruised by Cattle; for they will not grow kindly, and these are easily transplanted with success, seldom failing: If they be young, you need not cut off the tops, because, being very sappy, the wet will enter and decay the Plant; but, of considerable growth, you may cut them as you please, making a stiff mixture of Clay and Horse-dung to lay firm to the cut places to defend them from the descending Rain, which would otherwise soak into the Wood and injure the Plant. Some have a way, and with good success, to remove large Elmes the quicklier, to make a shade about their Houses, or shelter their Grounds, by opening the Earth about the Root of one of fifteen, sixteen, or twenty Years growth, cutting off the spreading roots about a Foot and a half, and leaving only the stump-root to draw Sap to, then cover it again, and if it appear with no visible decay, the next Year they remove it, when the Sap is well ri-

rising, and plants upon Ground more moyst and more apt to receive it than where it first grew, forming the Root deep, and covering it with good Earth: so that pleasant Groves of this have suddenly been erected where Trees have been scarce, to the great admiration of those that have known the place bare a little before, and from Trees of a dwarfy growth flourishing to a very fair Wood, which could scarcely [illegible] Sense [illegible] was the same place. This way is like wise taken by Willows, and other light Wood, which will grow from great Poles without Coots, if set in agreeable moyst places.

The Elm is a Wood much using wet or dry, and serves for a great many uses, growing to a prodigious height, affording great store of [illegible] and [illegible] and is set [illegible] between [illegible] among them all spine and hearts [illegible] and being very tough and [illegible] for the use of Wheel-wrights, Plough-wrights, making of Carts, Building, Planks, Coffins, and many other uses: the young Sprays are good for Cattle, Coneys, or Deer to browze on, and the biggest Boughs make good Charcoal, and as it is common, so it is of very great use.

The next to this is Beech, formerly greatly in use for building, delighting in warm Lands, and growing to great stature, making a lovely shade, so that in former days it was usually planted about Princes Palaces, though it delights most in the sides and tops of high Hills, &c. and the roots will wonderfully penetrate stony places.

Where large Oak-Woods have been felled, Beech-Trees have been known to spring up in [illegible] none growing there before. This is raised from the Mast, as the Oak, and from young Plants, planted as the Oak: when young it grows but slow, but when it has got a head it mounts and spreads apace, none sooner attaining to a large bulk than this Tree; and, though whilst young it may happen to be crooked, knotty, and ill-shapen, yet growing to a good body it will overcome those defects, and be straight and a very compleat Tree.

UMI

This Wood is of great use for Joyners, Turners, Upholsterers, and formerly much used in building and flooring, being clean, white, not apt to rend, or split; it is good Fuel, burning clear and light, making excellent good Charcoal, though not lasting; the Mast of it feeds Deer, Swine, and many sorts of Fowl, Pheasants particularly delight in it and grow fat upon it; the Wood, with fine Saws, being cut into Scabboard, or Scale-boards, very thin, serve for many uses. It makes good Blocks for rigging of Ships, and many other Materials belonging to Navigation.

This Tree planted in Walks and Avenues, casts a very pleasant and delightful shade all Summer, few or none excelling it for colour or coolness.

The leaves of this Tree gathered in Autumn, before the frost has nipped them, are excellent to lay under Beds, as Matresses, keeping them cool, and free from Insects; they cast a pleasant smell, and will keep so seven Years.

CHAP. L.

Of Ash, Walnut and Chesnut-trees, &c. Their Improvement and well-ordering.

THE Ash is another very profitable Tree for Timber and Fuel, being of a quick and thriving growth; it delights in good Land, though almost in any other it will thrive, as barren Mountains, Land hardly fit for any other use, but the much spreading of the roots where they stand, near Arable Land, hinders the Plough, and the Water dropping from them much injures the Corn; Woods, Coppices, Wastes, &c. may be replenished with them, they usually growing better where other Timber has been fell'd, or decay'd by a long growth.

In White and Chalky Land they prosper very well, as appears by those of a very large stature growing on such Lands in *Wiltshire*, *Hampshire*, and other Counties in *England*; the Lops and Timber turning to a very great advan-

These

These Trees may be propagated of the Keys sown, gathered in *October*, or after, when they are about falling off from the most thriving Trees: These may be sowed in a Nursery, and the Spring come twelve-month they will be fit to transplant to such places as you design for a continued growth; but this, as of all other Trees, is a slow way, and therefore I advise rather to get young Sets of a moderate size, and cut not off the young tops, because they are very happy, if it be of the Seed, but if of the young Plants, you may cut them near the Ground, and if they take good root, as they will for do, you need not fear but they will send up young Shoots and grow apace; and if any of them be grown up, and decay, if you cut them near the Ground they will revive and sprout up with more speed, and flourish exceedingly.

If you intend to have a Grove of Ash on a Hill, or in open Ground, set the Seeds in rows with a Setting-stick, after the Ground has been lightly broke up, let them be at some distance, and many Seeds in a hole, that some may infallibly live; and without transplanting, they will in a few Years spring to a good height; but if many Plants come up in one place, remove the underlings, that the main Plant may grow the freer, by being disencumbred; but beware that Cattle destroy them not when young. You may plant them among other Trees that are grown pretty well, to defend them from their brouzings, and from the biting cold.

The use of this Wood is almost general, is proper in Building, where seasoned, or well dried; it stands the Wheel-wright and Wheel-wright in great stead; Coopers and Turners are much profited by them for Poles; it is excellent either for the supporting Hops, or any aspiring things that cannot, without help, support themselves, and serves the Husbandman and Gardiner for many Tools and Instruments; it is used in many things about Shipping, and in Maritime Affairs; as for Fuel, it burns sweet, and dry, leaving curious white Ashes behind them, and little earthy grains: The Leaves stamped, and laid to the bite of any venomous Beast, draws out the Poyson; and what exceeds the Juice of the Leaves are drank against any Poyson inwardly received. The

The Season for setting the Ash, for the best growth, is from the end of *October*, or beginning of *November*, till *January*; for if the Sap at setting be but a little in the Tree, the Worm takes it and hinders the growth very much, spoiling in the end the Timber. I have been credibly informed, that an Ash at forty Years growth from the Key, or Seed, has been sold standing, for thirty Pounds, and the Person who bought it got ten Pounds by it, when cut out into Timber and Fuel.

As for the Walnut, Chesnut, and Service-Trees, they are proper to the Woods, yet bear Fruit very advantagious to the owner.

As for the Walnut, it grows best on Hills, where the Ground is tollerably good, in a curious Sandy, or Gravelly Soil; and, beside the Fruit that is delicious and nourishing, making good Oyl for sundry uses, the Wood is of great esteem for Gun-stocks, Cabinets, Inlaying, and many other things. This Tree grows of Sets, or Nuts, to a prodigious bigness, though it rises not so fast as the Ash; and if you design their propogation by Nuts, after you have laid them to sweat, enter them in Sand, and at a Month's end put them into Water, and those that swim lay aside as useless, but such as sink, dry them and lay them in Sand a Month more, and then, in the beginning of the Spring, set them, and they thrive best unmoved, therefore set them at a distance one from another, and when they grow up fit for transplanting, if occasion require it, mark the quarters of the Winds as they stand, on the Bark, and place them, when removed, directly the same way. Sets may be taken from the Roots of the growing Walnut-Trees as they are well-springing up, with some little of the Root and Bark with them, and set in Sandy, or a mixed Soil, *&c.*

The Chesnut-Tree was formerly very flourishing in England, as appears by many eminent ancient Buildings, whose Timber mostly consists of that Wood, being very firm and durable. These may be raised from Nuts as the former, viz. spread them when they are so ripe that they drop from the Tree, and let them sweat a while, then use them, in all respects, as the Walnut, set them at a distance

in

to a mixed Soil, for they thrive beſt unmoved. You may ſet them in Winter or Autumn, in or without their huſks, or you may ſow them with other Maſt for the raiſing of Coppice.

It is a very thriving Tree, producing extraordinary good Coppice-wood, ſpeedily, and in ſome twelve Years time grow to a kind of Timber, and bear plenty of Nuts. This Timber, for durance and ſervice, is next to Oak; being planted in Hedge-rows, or Avenues, it yields a pleaſant ſhade and ornament.

The ſame Trees are raiſed from the Berries, as other Trees may be, which, being ripe, may be ſown as other Seeds, and they will grow apace; or you may draw young Plants in Woods, where they are eſtabliſhed by other more ſpreading Trees, and cannot well come to their growth; they caſt a beautiful ſhade, and the Berries cauſe good digeſtion; the Wood is uſeful for Joyners, as being of a very delicate Grain, fit for many uſes; it alſo yields Fuel for Fires.

The Birch is another Tree very uſeful and profitable, that will grow almoſt on any Land, ſo that barren Land may be much improved by it; it will thrive on hot burning Sand, in cold moiſt Clay, and in marſhy Ground. Rooty, or ſtony places; this is generally produced by Suckers, which may be planted at five or ſix Foot diſtance, and they will grow a great pace, riſing, as it were, ſide-branched Trees; about the firſt Year they may be cut with a Hook or Graſſing, and they will ſhoot out very ſtrongly. This Tree yields excellent Sap in great quantity, and being prepared with Honey, or Sugar, into a Wine, is very medicinal, as well as a pleaſant innocent Liquor, called Birch-wine.

It may be extracted by cutting ſome ſmall Branches when the Sap riſes, in the end of *February* and beginning of *March*, the Weather being open, and eſpecially when the Wind is at South or West, hanging Bottles at the cut Branches, to receive the deſtilling Liquor; or you may bore the Tree and tap it: and by this means you may get great quantities, it flowing forth very freely. The ſmall Branches of this Tree turn to great advantage in making

Brooms,

Brooms, Whisks, Wickers, and many other uses they are put to; the Timber is likewise very good, and the greater Branches make good Poles.

CHAP. LI.

Of the Maple, Horn-beam, Quick-beam, Hazle, Box, Juniper, Holly, and Fir-Trees, how to Order and Improve them.

THere are yet other Trees useful, either for Fuel or shade, that turn to the advantage of the industrious Husband-man.

The Maple. This requires a dry and sound Mold, growing in Hedge-rows very well, as also in Woods and Groves; it may be propagated by Sets, or the Keys of the Ash. The Timber is much esteemed for its whiteness, and the Diaper-knots found in it serving for Trenchers, Bowls, and many other Utensils, and much esteemed in Joyner's Work.

Horn-beam much affects the open parts of Woods, and set in Walks or Avenues, produces a pleasant shade. It will grow indifferently on any Soil, it must be set deep, and the Sets may be about two Inches in compass in the middle; it may likewise be raised of those Seeds that are ripe in *August*, if sown in *October*: But since most Woods yield sufficient Plants, I like the setting them best, for the greater expedition. The Timber is very hard, and therefore useful for Wheel-wrights, or making Tools for Rural use.

Quick-beam prospers best in good light Ground, though it delights in Mountains and Woods; Plant the young Sets as the former, or it will grow from the Berries that are found ripe about the middle of *October*; It grows space Woods and Coppices, yielding excellent Fuel, and is good for divers other uses.

The

The Hazle, though of great value for the Nuts, yet is a Wood-tree, affecting above others, dry, barren, and cold Sandy Ground; likewise Rocky and Mountainous Soils produce them, though they thrive much better in Hedge-row, where the Sun has power to invigorate them.

This Tree is properly raised from the Nut, preserved moist, but not moldy; and to do it, you may lay them in their own dry Leaves, or in Sand: These ought to be set about the latter end of *February*; but, as in the case of all other Trees, young Sets, or Suckers, will sooner grow; but cut not these the first Year, but the Spring following, within three or four Inches of the Ground, that is, if your Sets be small; but greater Sets may, the first Year, be cut within six Inches of the Ground.

The Hazle, though it seldom grows to substantial Timber, is yet very profitable for the bearing of Nuts, for the feeding of Swine, and pleasant for the Food of Man, out of which, is likewise extracted a curious Oyl. They produce curious Poles and Rods, make Fishing-rackle, and divers other Instruments; also the Under-items and Sprays, good Charcoal, and Fuel, and is a good shade and ornament to Walks. When the Nut-trees flower much, it is a sign of a plentiful Corn-harvest.

The Box-tree is of a great use, though of slow growth; it will grow on any indifferent Land, and is encreased by Slips; it keeps green all the Year, and gives a very pleasant prospect: the Wood is of singular use, and bears a great price, being usually sold by weight: So that a Grove of well-grown Box of six Acres has been sold for 3000 l. the least part of this sort of Timber being fit for one use or other, and too precious to be committed to the Flames.

The Juniper-tree covets to grow on hilly and gravelly Ground, the Wood, Leaf, and Berries, are medicinable; it may be sowed of the Berry, or set of small slips; it lasts green all the Winter, and in burning casts a curious scent. It is proper to make fine Boxes, Cabinets, and other curious Works; the Scent of it keeps away Worms and Moths; its Gums, or the sweating of it, is good against pains in the Stomach, or heart, and perverse noisome Air.

Holly

Holly is a tough Wood, keeps green all the Year, and carries on it in Winter, a curious red Berry; it thrives in any indifferent Ground, and may be set by Slips, or Berries; the Wood, if large, yields a good price.

The Lime-tree must be planted in an indifferent rich Soil, for it will not thrive in hungry, cold, dry Land; it is raised as Suckers from the Elm, or from Seeds, or Berries that drop in Autumn from the Trees, and these are mostly used for ornament in Walks, casting a lovely shade, though in Woods they grow a good pace, and yield Timber, Pole, and store of good Fuel.

The Yew-tree may be propagated in any barren Ground, even on the blackest Hills or Mountains, it being hot by nature, producing a curious red Berry, lushious, and sweet as Honey, though the Stone, or Seed, of it be very bitter; and these Berries put into the Ground, will grow, and being set regular, about eight or ten Foot distance, produce, in a little time, a very curious Grove, green all the Year; the Wood of it is very sappy and tough, bearing a good price, for of it are made our best *English* Bows, exceeding those of all other Nations; these trees, as other, may be planted of Suckers.

The Fir and Pine, being naturally hot, delight in cold Grounds, high and rocky Hills and Mountains; they will be raised by the Kernel taken out of the Clogs, or Pine-apples, soaked in Water, and then exposed to a gentle warmth; these you may sow in a Nursery, or where you intend they shall grow up to a Grove, or Wood, especially the Pine, which will hardly bear a remove, unless very young, though the Fir may be very easily removed, and propagated on Slips, and will grow small and streight, to a prodigious heighth, if it take good root, even to sixty foot high in twenty Years growth, though in the six first Years they seem not to grow very fast, but afterward shoot up exceedingly.

CHAP.

CHAP. LII.

Of Trees delighting in wet Ground, as the Poplar, Aspen-tree, Alder, Willow, &c. their Ordering, and the best way to improve them.

THus, Reader, having declared what is necessary for the improvement of dry barren Lands, by planting the most useful Trees for Timber and other services, I think it fit, in the same manner, to instruct you to improve wet, boggy, and otherways useless Lands, by planting of Trees to yield great store of advantage by Fuel, *&c.*

The Poplar, a Tree well-known, grows exceeding well in moist Grounds, near the brinks of Rivers, but not in the Water, as the Willow; this Tree is propagated by streight Branches, or Pitchers, set in the Ground; but beware you cut not off the tops till they are of two or three Years growth, and head them at eight or ten Foot high, and in a few Years their Branches will spread exceedingly. The Timber is white, and of singular use to Turners work, and to make Tools for the Husband-man, and besides its pleasant shade it yields abundance of Fuel.

The Aspen-tree delights in moist, wet Ground, though it will grow in Woods and Copices; it differs not much from the Poplar, and is propagated by young Suckers, whose tops you must not cut off the first Year.

The Alder may, with success, be set in wet Lands, which much improves it; of these you may set Truncheons, which they will grow very fast, they will also grow of Seeds, but the best are young Sets with roots, being set as big as the small of a Man's Leg, and in length about two Foot; cut not the smaller Sets till they have stood three Years, for so they will produce great store of Wood for Poles and other uses.

The Withe is a good improver of boggy Land, as alſo the Oſier, which turns to a very great advantage, being worth 9 or 10 *l.* an Acre, where the Land before was of little or no value; if they can be carried eaſily by Land or Water, to the places where they make Baſkets, Chairs, Cruttles, and the like Ware; they may be cut every two or three Years.

The common Willow affords much Fuel, Poles, and Binding-rods; this will grow either by Roots, Slips, Truncheons, or the like; plant them in *February*, if the Weather be open, and ſo till they Bud.

Theſe watry Trees are of a clean white Wood, and very great improvers, increaſing exceeding faſt, and the Oſier, when they are once grown up, for being lopped, and are a good ſhade for Cattle in Summer, and afford them good brouzing.

CHAP. LIII.

Farther Improvements for Ordering ſundry ſorts of Trees for the valuable Improvement of Land, &c.

THere remain yet other things not treated of in relation to the improvement of Land by Trees, *viz.* As for ſuch Trees as caſt their Leaves in the Fall, the beſt time to tranſplant them, to other convenient places, for Timber, Under-wood, Shade, or Ornament, you may do it, the Weather being open, in *October*, *November*, and, upon neceſſity, till they begin to bud, in the Spring; and thoſe Trees that do not ſhed their Leaves, but are green throughout the Year, are beſt removed in the Spring, when the cold is abated and the Sun opens the pores of the Earth, that the Roots may ſpread, and the Sap be nouriſhed by freſh moiſture, and it may be well done in April.

The pithy Trees, as the Ash, Lime-tree, Sycamore, Aspen, &c. need no cutting, upon transplanting, till they have well taken root one Year; and then, to hasten their growth in bigness, you may cut the tops of the uppermost branches that too luxuriously expend the moisture that should feed the bole and under-branches. As for Fir, or any Rosiny-tree, cut not the roots, nor the branches, but a very little, because they will be apt to spread their Rosin, or Turpentine, too much, to the decay of the Plant, for that is it which keeps it alive and and makes it prosper.

This method may be used to transplant Suckers, Scions, Slips, or Layers, of Birch, Elm, Chesnut, Oak, Beech, &c. But where they have not good root, it must be done in the Spring, when the Sap is risen, and they begin to put out their buds. All Trees delighting in wet, or watry Ground, may well be transplanted in *February*, or *March*, before they are too forward, if the Frost be not out of the Ground.

Remove Trees rather into a better than a worser Ground wherein they naturally grew, or, at least, so much good Earth in the holes you make to set them in, as may first give them a fixed rooting, and so they may get a head, and when they are once acquainted with the nature of the Land they will thrive amain; let as much of the Earth in which they first grew, as may be, adhere to the root when you remove them, that so they may be the better nourished, and grow more kindly, and let the spurns of the roots be, as many as may be, pretty long and large, except the top and downright roots, that so they may spread every way; and, that they may the better do it, make the holes you set them in large, and fill in the Mold loose upon them.

If you would have your Trees prosper well, remove them not out of a warm shelter into a bleak, cold Air; and to keep them steady and upright, that they may not decline, nor much loosen by the blowing of Winds, raise the Earth pretty high about them above the level of the Ground.

The

The Oak, Pine, Walnut, and other Trees, that bear ſpreading branches, at the tranſplanting, ſet at a good diſtance from each other, at leaſt forty Foot; but the Beech, Aſh, Yew, Fir, and Cheſnut, may ſtand much nearer, *viz.* at a third of the diſtance. The Hornbeam and Elm, will grow the neareſt of any Trees together, and theſe you may plant in a regular, or a promiſcuous order.

As for the watring of Trees in dry Seaſons, care muſt be had of it whilſt they are young, eſpecially as ſoon as they are tranſplanted, for this ſettles the Earth about them, and makes the Roots take firmer hold, and if they have been far fetched, ſet the Roots in Water ſome time before you plant them, and if you find the Wind much ſhakes them, ſet ſtrong Stakes by them, and faſten the Trees to thoſe Stakes with wiſps of Hay, that they may the better be ſtrengthned, and ſo order it, by putting Moſs, or Hay, between the Plants, that the rubbing may not fret, or gall them; you may lay about the Roots of them, Fern, Stubble, Hawme, or any other ſuch like things, that, in the firſt place, it may keep them warm, and, in rooting, dung them: Stones laid about the Roots of Trees, keep them moiſt in Summer, and warm in Winter: Coppices may be planted about Autumn with young Sets, or Plants, the beſt way in rows, at ten or fifteen Foot diſtance, for then you may very well reap the benefit of Intervals, by ploughing, digging, and ſowing, and have a great deal the better conveniency for the grazing of Cattle, and proper ways for Wains, or Carts, to fetch away the Timber, or paſs from one Ground to another; beſides, it will yield you pleaſant ſhady Walks; and then, if you would thicken your Coppice, when well grown, bend ſome of the Boughs that are neareſt to the Ground, give them little nicks on the back of the bending, and put them a little way ſo bow, ed into the Earth, covering them with Mold, and keeping them from riſing with hooked Stakes driven into the Ground, and, ſpringing up, they will produce a great many Suckers, and, in time grow up into Trees, or, at leaſt, conſiderable Under-woods.

CHAP. LIV.

How to Order Trees for their better growing and more speedily turning to good Advantage.

TO preserve Trees in good plight, and to make them grow apace, there are other things required, than what I have hitherto mentioned.

First, Prune them, when they are somewhat well grown, taking off with your Pruning-hook, the smallest, and most superfluous Boughs and Branches, doing it upward, about *January*, that what of the Snag remains to the Tree may not split; and the best way is to cut them off as close to the Body of the Tree as may be, lest the Stump rot, and Water get into the hollow part to spoil and dost the Timber.

Secondly, When you perceive your Plants will not grow up to tall Timber, shroud them, or lop them, and they will grow up to be very good Pollards: This must be done above the height of the reach of Cattle, smooth, and close, taking off the top and main Branches; this may be done in the beginning of the Spring, or the end of the Fall, and so, when they are grown up, you may lop them every four or five Year for good Fuel; besides, these may stand in Hedge-rows, or vacant places, fit for no other use, and, after they have afforded you great store of it, the Bodies, if they hold sound, make a good sort of short Timber, very fit for Planks, and other uses. As for Winter-greens, as Pines, or any other rosinous Tree, they must be cut in Winter, after the great Frosts, and coldest Winds are over; but in no wise be beheaded, but the collateral Branch much cut off.

Thirdly, All Trees delighting in wet, or moist Ground, may be shrouded, or lopped, in the beginning of *March*, the Weather being open, but not too near the Body, lest it endanger the Tree, and hinder its sprouting.

Fourthly,

Fourthly, Coppices may be felled, or cut, from *September*, to mid-*March*, leaving such standards, as you intend for Timber, at an equal distance, chusing out the straightest, and most likely thriving, for that purpose; cut not above half a Foot from the Ground, and that sloap-wise, that the young Sprigs may the better shoot out, and grow, and furnish you with a second Felling.

Fifthly, When your Timber-trees are arrived at their best state, or you have occasion to fell them for advantage, fell the Oak from *April* till Mid-summer, for then the Sap is proud, and the Bark, which is a very good Commodity, will easily be got off: But for other Timber, the best Season is in Winter, when the Sap is low; for if it be much in those Trees, it breeds Worms, and much defaces the beauty of it: and the propereſt Months, are *December*, and *January*; when you fell large Timber, cut off all the large Arms first, lest they endanger the Tree, in falling, or breaking in the fall.

CHAP. LV.

Sundry Trees not yet mentioned, their Growth and Well-ordering, for the Improvement of Land.

Cypress Trees will grow tolerable well in *England*, and is not only pleasant for the cool refreshing shade it casts, but in indifferent mixed Sandy, and Clay-ground, it will grow to a considerable stature and thickness; but then they must not be set in over moist, or wet, places; and though they are most used to shade Walks, Avenues, cover Arbours, and adorn the centers of green Plats; yet where they come to any thing of Timber, their Wood is exceeding good, hard, and durable, of a good Scent, preserving Cloaths from Moths and Worms, and lasts a long time without corrupting, or rotting: *Pliny* affirms he saw Gates of this Wood four hundred Years old, and yet, neither Worm-eaten, nor perished.

The Pine-tree is somewhat of the nature of the Fir, of a resiny Sap, and a very hot Tree, therefore it thrives best in cold places, where the heat of the Sun cannot make it sweat too much, to spend and destroy itself, though it delights much in Hills and Mountains, where the Air is more free and cooler always than in the Valleys, yet will it thrive well enough in Woods, especially if they be upon a little rising ascent, that the wet passes away, and a mixture of Earth, of Gravel, Sand, and Clay; and, as the former, may be improved by Slips, or Scions, so this may also, and by the Kernel sown which comes out of the wooden husks of the Apples it bears: And were this Tree better regarded and improved in *England*, it might turn to as great an advantage here as in other Nations; and even our Hills might be covered with these, and Fir-trees; so, that in a few Generations, we need not be at the expence of buying and fetching home Timber of this kind, but have plenty of our own, to the great improvement of Land, that now is of little or no value.

There are some other Trees natural to other Countries, that might be propagated in *England*, and turn to the advantage of the industrious Husband-man; as the Larch-tree, a lasting sound Wood; as also, the wild Olive, Almond, Date, Cedar, which, by good management, are conceived to grow well in this Country, and may be brought to a great improvement, though not to that perfection their native Soil gives them, yet so far as may be an advantage, very highly, to those that are at the trouble of planting and rearing them; for, when they are once well entred, they will produce numbers, and grow themselves without any further trouble, unless sometimes pruning and watering in a dry and parching Season, till their spreading tops are sufficient to shade their Roots, and prevent the Sun-beams from sucking up too much moisture from about them, and may, as other Trees, be transplanted as occasion requires.

CHAP.

CHAP. LVI.

Of Trees fitting for Timber and other Uses; the ſundry ſorts; their goodneſs, and to what uſes properly to be attributed; very neceſſary to be known, &c.

I Shall now, from what has already been laid down, proceed to the uſefulneſs of the Timber and Wood produced by Trees, that have not as yet been amply touch'd on.

Cedar and Cypreſs are excellent in Building, for their laſtingneſs; as not, in a great number of Years, being ſubject to corrupt.

The Fir, Poplar, Aſh, and Elm, are exceeding good for the inward parts of Building; as for main Timber, Joiſts, Rafters, Floors, &c. but hold not ſo well where they are ſometimes wet, and at other times dry, as the Oak does.

For the conveyance of Waters, the Alder, Pine, Pinch-tree, and Elm, make curious and laſting Pipes; but then they muſt be covered with Earth, for above Ground they will not well hold, eſpecially in hot Weather, by reaſon of their ſhrinking; eſpecially all but the laſt, which will do tolerably well.

The Oak, Beech, and Walnut-tree, endure very well in the Water. The wild-Olive, Maſh-holm, and wild-Oak, are of long endurance.

For Rafters and Mortice-pieces, the Elm and Aſh are very properly adapted, becauſe of their length: The beſt to bear weight is the Fir, and the Larath; which, howſoever you lay them, will neither bend, nor fail your expectation till Worms conſume them. On the contrary, The Olive and the Oak will give and bend, and ſo will the Poplar: The Willow, Birch, Elm, and Date, uſually

bend against the burthen they bear; the Poplar, on the other side, giveth upon every light weight; the Elm, and the Ash, though slow, are easily bent.

These are easily wound and bent, viz. The Willow and Birch, and the tender Oak; Shingles to cover Houses are best made of Oak, Beech, and the Wood of such other Trees as bear Mast; also of such as yield Rosin, as the Pine, and the Pitch-tree.

For Tables, Stands, Bowls, and such other houshold Utensils, the Maple, Ash, and Walnut, are very curious, graceful *English* Woods, and much lasting.

Box is a Wood well known, of great value for its firmness and durableness, and usually sold, for its preciousness, by weight; and serves for Combs, Hafts of Knives, Mathematical Instruments, and so many Mechanical uses, that little, except the very tender Sprays, can be counted waste in it; so that an Acre of good growth of this is held to exceed, by much, the value of twenty Acres of the best Corn; and therefore considering when once it is well got in the Ground, that every twenty Years it may be well cut, and the stools left will produce new Shoots to supply the place of what was taken away, what great advantage may be made by it, in improving Land where little else will grow, and that it requires no yearly toiling, ploughing, and sowing, nor the charge of Seed.

Holly is another excellent Wood, useful for Whip-stocks, Caps of Carts, and Sidings; as also for any thing that requires a strong, tough, lasting Wood; but above all, the Bark has of late been found famous for the making of Birdlime; the which, because it may be grateful to the Country-man, not only in taking and destroying such Birds as annoy his Grain, but to furnish his Table, though it be somewhat a digression from the Subject, I shall, however, by the way, give him a Receipt to make, and use it, and then come again to a consideration of what I intend as to shews, in relation to the Ordering of Trees, and Improvement of Wood-lands, for his advantage.

CHA

CHAP. LVII.

A true Receipt how to make the best Bird-Lime.

WHen the Sap is full in the Bark of the Holly, about Midsummer, take that which is well grown, and strip off a considerable quantity of the Bark, and boil it in fair Water, till the gray and white Bark part from the green; so separate the green, and lay it on a heap on a Tyled, or Stone Floor, in a Cellar, or some such cool place, covered with Weeds, for the space of ten or twelve days: in which time it will putrifie, turning into a slimy quality; then put it into a Morter, and beat it with a wooden Pestle, till nothing but slime remain; so that no part of the Bark being to be discerned, it may be wrought like Wax; then walh it in a running Stream, that no moat or husk may remain in it; after this is done, breed it into a glazed earthen Vessel, cover it close from the Air, and there it will fume up, and purge out its scurf and drosse; and, after six days, scum it off; and continue so doing till no more arise, then, that you may keep it for use, shift it into another clean Vessel.

When you use this on Twigs, Straws, or Bulhe, according to the quality of the Fowl you design to take, warm it, and mix it with a little Hogs, or Goose-grease, over a gentle Fire, till they are well incorporated, by frequent stirring; then anoint the Twigs, Straws, or Bulhe with it, as even as you can, without leaving any knots or roughnels; and place them either in Woods, or Fields, where the Birds you intend to take resort; and place what Allorements you think fit, in Meats, or other Matter, as will be most taking to them, and place them so, that when they descend, they must needs touch them, and such as do will certainly be entangled; for if they rise with them on their Feet, they will certainly lap their

Wings, and that will cause them suddenly to fall: and, as the greater or lesness of the Fowl is, so must you proportion your Twigs.

CHAP. LVIII.

Wonderful Improvement of Land, by planting Trees, and by Inclosures; shewing the advantage of it over those Lands that lye in Common.

WOod may be greatly improved, by inclosing Ground with it, for Corn and Pasture; yielding a great many advantages to the painful Husband-man, whose good Industry well deserves a good Recompence.

First, For that well-grown Trees, and good Hedge-rows, shelters his tender Corn, &c. from bleak Winds; and keeps off the blastings that would much annoy it, even when grown.

Secondly, It is a great advantage to Pasture-lands, in sheltering Cattle, both in the heat of Summer, and in the extream of Winter; as also from violent storms of Rain, Hail, or Snow, &c.

Thirdly, It secures Corn from High-roads being made into it by idle Persons and Cattle; which, if it lay in common, or open, could not be avoided, since those, that know not the toil and cost the Husbandman is at, to bring his Crop to a Harvest, little regard what havock they make, through lasiness, for wanton disportment, or the nearest way; which, if there were a Barrier of good Fence, they could not do: and then for Cattle, it sayes the trouble of Pounding, and many frivilous Suits, that frequently arise on trespasses of these kinds; and therefore is advantagious both to the owner of the one and the other.

Fourthly,

Fourthly, Trees growing up, their Lops afford much Fuel and Fencing, perpetually supplying the owner with both, as occasion requires; and indeed few know the scarcity of the first, so well as those that live distant from Inclosures, in open champion Countries, where Coals cannot at all, or at least, without great charge and labour, be had; not only the pinching Winters afflict these, but even their necessary occasions, of Brewing, Baking, and Dressing their Provision, make them sensible, to their great cost and loss of time, that the planting of Trees is extreamly beneficial, for that, being at hand, they may keep it in a readiness, by getting it in, and laying it up to dry, at leasure times, to their great comfort and advantages; and be profited in selling the overplus, to the rich, and charitably bestowing some on their poor Neighbours; and, for their Christian Compassion towards them, be loaded with their Blessings and Prayers: and of this, one Mr. *Tusser*, one very much experienced in Rural Affairs, in his old fashioned Rhime thus speaks:

The Wood-land above all I praise,
the Champion delighteth not me;
For nothing of Wealth it doth raise,
to such as laborious be:
In Wood-lands the poor Man that have,
scarce fully ten Acres in Land,
More merrily live, and do save,
than th'other with forty in Land.
The one hath, in every Hedge,
both plenty of Fuel and Fruit;
The other lays Turf up and Sedge,
and gets it by wonderous suit;
And ready in Winter to starve,
when th'other you see doth not so,
But has what is needful to serve,
when th'other all ragged does go.

There

There is, indeed, a great difference in the advantage arising between Inclosures, or Wood-lands, and such as lye open; and though some may be apt to grudge at the Inclosing of Commons, yet, were there a good measure taken therein, it would greatly turn to the advantage of the poor, and much improve the riches of the Nation; there being so much good Land, lying as it were waste, might be inclosed and let to the benefit of the poor; to the great ease of the Parishes, and advantaging those that claim a right therein, three or four times more than what now it can; for the poor having little stock to put there, the rich make their advantage, who have much; which, if it was inclosed, and let out for the general benefit, they could not do; and so thereby the stock of Corn would be greatly advanced; and, in some Years, a good improvement of Timber might be made, many Commons and Moors, that now lye in a manner waste, and are of little profit, being capable, with a little industry, of producing equal with Lands of a good value; so that things thus rightly stated, every one concern'd might have a right understanding, and be highly satisfied in so good a Work.

Consider, in this case, where the Grounds are inclosed, how happily people live; as in *Hartford-shire*, *Essex*, *Kent*, *Berk-shire*, *Surry*, *Wilt shire*, *Somerset-shire*, *Hamp-shire*, and others; all which not only raise Corn for themselves, but supply other open Countries, and even the great City of *London*, which consumes a vast quantity thereof; and yet no parts of *England* set a greater rate, or make a greater advantage by Grazing.

Therefore I must say, that all Interests upon Commons, or Rights of Common-pasture upon any of these Lands, may, without prejudice to any particular Interest, be advantaged, and much improvement made to the Publick, considering what vast quantities of Land lye, as I may term it, waste; some over-run with Mole-hills, Ant-hills, Gosh, Fern, Bryers, Twitch-grass, and the like; others under Water, for the want of opening the Currents, and Passages for Brooks, or Water, descending from Hills; for, whilst it lyes thus, every one concludes it not

his buſineſs, and ſo it lyes neglected; and many, however, claim their part in it, that will beſtow neither coſt nor labour in making it fit for good Paſture, or Corn-land; though, if it was ſo ordered, it might prove in a little time, the enriching of them, and be a means to diſburden the Pariſh, by the Rents ariſing therefrom, of the chargeable Poor, and be a means to employ labouring Men; ſo that every one would live at eaſe from encumbrances, or ſuffering wants.

But this, ſome may ſay, cannot be done without great encouragement of our Superiors, or, at leaſt, the general conſent of all that have any right or claim in the many parts of ſuch Land by long cuſtom. Suppoſe this granted, as for the firſt, Thoſe that are called together, to conſult the good and welfare of all the People of *England*, cannot be thought to be averſe to ſo great an advantage to the Publick, where Particulars are rightly repreſented and ſtated; ſince the Poor, reaping the Benefit, they being by far the vaſter number, it would be a great caſement to the Nation, in employing many, and charitably ſupporting others: And, for the latter, I preſume, there are few, that would not be induced to ſtudy their own good and advantage.

CHAP.

CHAP. LIX.

Of Inclosures, and Trees planted in Hedge-rows, both Fruit, and others; and the benefit arising thereby to the Owners of such Land, &c.

THere might be abundance of things said in the encouragement of Inclosures and Woodland, beneficial to private Persons, and the general good of the Nation, since so great a consumption of Timber, and Underwood has of late been made, in building of Shipping, Houses, in Iron-works, and Charcoal; which, if not in time repaired, will make this, or at least the next Generation too sensible of the decay of it; and the want of these Necessaries, will much obstruct the Trade of the Nation, as well as put private Persons to great streights.

The Earths proper in this case, may be chosen indifferently; but for Wood-land, chuse a warm, sandy, gravelly Ground, mixed with other Earth to temper them, especially with a moist, strong, cold Clay.

I have given divers Rules already for the meliorating Earths when they decay, or languish, by sundry Manures, and therefore shall not be troublesome to my Reader, in repeating what is already done; but where Inclosures are designed for Corn, by the way, that it is proper you make choice of a good, sound, middle, warm Land, than of the richest, and fattest that is, and it will produce a great encrease, and the Timber about it will pretty well thrive, and grow up in time to great spreading Trees, though not over high, so that the Boughs will be very thick and substancial, and the great Arms serve for divers necessary uses, as occasion shall require them in Building, or other Matters; and the Spray-lops provided a sufficiency of Fuel to skreen you from the cold: In the Hedge-rows you may likewise, to advantage yourself more, plant

Fruit

Fruit-trees, which being well grown, will, with a little care, bear better than those planted in Orchards, as lying more open to the Sun, and altogether unincumbred by others; so that by the Fruit great profit will accrue, and the due pruning them will add to your Stock of Fuel; besides, it will give a very pleasant prospect to the Ground, affording cool and delightful Umbrays in the Summer-season.

And this appears by Land already improved in this nature, in *Hertford-shire*, *Worcester-shire*, *Gloucester-shire*, and other Countries; redounding to the great benefit of the Owners, who have, by this means, a double Crop yearly, one of Fruit, and the other of Corn, and a third may, in some cases, be brought to perfection; *viz.* of Turneps, or such like, that may be sown, ripe, and drawed, before the Season for sowing Barly comes on; by which means Land may be improved to a great value, or if laid down for Meadow, or Grazing, nothing can be more accommodating to Cattle, than a Pasture fringed with substantial Trees, spreading their Branches, as I have hinted, to shreen, by sheltering from Rain, Winds, Heat, or Cold.

This I speak to incourage Industry, and this Industry consequently encreases Wealth, which always commands a plenty of what is necessary; and, being once gained, takes off much of the toil and labour Poverty imposes on the needy; so that the Labour of youthful Years, may comfortably supply old Age; to do which, experience teaches us, it is very necessary.

It is allowed by the most judicious, that shadiness in Summer, and warmness in Winter, occasion'd by Trees, much helps and betters the Land; for in such Fields we find the earliest Grass, and frequently the greatest Swath and Burthen, and consequently more Corn than in open places, exposed to bleak Winds in Winter and Spring, and the Sun's hot Beams continually lying on, and parching them in Summer, from Morning till Evening-tide: Hills indeed, may reasonably keep off some Winds, and make them fly over the Champion-ground; but I cannot conceive we have any that cast so large a Shade, especially

by

ly in Summer, when the Sun, as it were, in a manner runs burning over our Heads, that give any tollerable shelter from its Beams at Morning or Evening, which Trees, growing near about the Ground, will infallibly do, and in some parts, or places, all the day long to good advantage.

This Ground will feed more Cattle, and sooner fatten them, than that which lyes open and exposed to the Weather; and certainly, where Trees are formerly planted, and grow not too thick, none can see reason to the contrary of what is said: As for Land, I know very much, if not most of it, that was worth not above ten Shillings an Acre, some less, now the Grass of most of it thus enclosed, and planted, is three times advanced, or more, the Fruit growing in the Hedge-rows, and Avenues, overpaying the Rent, and the Crop entire to the Owner.

But say the Land were worth twenty Shillings an Acre, or more, this will cause the Trees better to prosper, and produce a greater Crop, and the less cost in manuring or ploughing may be bestowed on it.

If you set rows of Trees, either Fruit or others, in the middle of your Fields, at such distance as not to hinder the Sun from bringing forth the Grass, or ripening the Corn, it will yet turn to a greater advantage, as four, or six fold, and make the Husband-man, in a little time, rejoyce in his labour, and so much Land now of little worth may be very much improved; and if so it happen, that one Crop fails in a Year, it is not morally pallible that both should; and so one hitting, will, however, make you savers, and rather more, by a great deal, if it happen any thing to the purpose.

These things may be done without much toil, or cost, and prove in a manner a recreation to the industrious Farmer, or his Servants, at leisure hours; and Plants and Grafts may be had out of his own Nurseries, or Orchard, where the thick, growing together, encumber one another; and, for other Trees, every Wood, or over-encumbred Hedge-row, afford a sufficient store; for if a Man at first be unprovided, at little cost he may be furnished; and then, having of his own, he may improve and multi-

ply a few to greater numbers, till his encrease is sufficient to supply himself, and others, to a very considerable degree. So that all things being well considered, those that are desirous to do well for themselves, or for their Posterity, will hearken to what I have laid down, that so Wealth and Plenty may encrease to them, and, by so doing, they may incite others to imitate them.

CHAP. LX.

Reasons for Inclosures and Wooding of Land, both for the private and publick advantage; and the Objections made against them answered and confuted in many convincing Particulars.

HEre, to draw near a conclusion of the Subject-matter of this Book, I come to answer a main Objection against Inclosures, and shew the advantage of them; but, the more smoothly to come to it, I affirm, that very many Wastes, Forrests, Moors, and Common-fields, as they are now enjoyed, through the oppression of the Rich, and sloth and idleness of the Poor, and misusage of all, are of little advantage to the Publick, being Commonable at random; nay, whether they are not worse than nothing, some Years yielding a little profit and encrease, which in other Years is clearly swept away, old Stock and all.

I know, upon some Common-fields, the Poor are forced to more charges in keeping their Cows, Horses, or Sheep, than would keep them in good Pasture, without any care or trouble; it being the daily business of one Person to tend two or three Cows, &c. for fear of breaking into other Men's Grounds, and so occasioning lutigious Suits by trespasses, whilst the party tending them, might, at indifferent labour, earn more than the grasing in good Pasture would amount to, and prevent all fears and dangers, by being en-

enclosed within good Fences, not only of their straying but of troublesome borderers on Commons, &c.

Now the Objection is, If this were not, how should so many poor Men, Women, and Children, be imployed; now one Town maintains many great Families, and many Families live upon the Common, which then must fall, and go a begging?

Now, that I may manage this Objection to the purpose, the great *Remora* to this Improvement (all other Objections seeming to me, in comparison to this, as nothing) most Men herein being much beclouded, and very many wise Men so charitably bewitched herewith, I must therefore demand,

First, How these People live? Why, truly, in a very mean, low condition; at hunger and ease, for the most part; and for the best of them, they live an uncomfortable, moiling, and drudging kind of Life; what they get, they spend; Plough, Sow, and Reap, and all to bring the Rear about, and well if they can make even at the Year's end; and this kind of miserable living they seem to be contented with, because they cannot better themselves.

Secondly, As aforesaid, many of these People are employed, but to loss, and very great loss too, when their Pains and Charges is far greater, in keeping their Cattle and Herds by Corn-fields, in the High-ways and Lanes, than that they might have them pastured for.

Thirdly, What are the People fitted for hereby? Why Idleness, and an aversion to Industry; and as it were render themselves useless to the Publick, living altogether in ignorance, having little regard of their Souls or Body.

Fourthly, Now Inclosures will bring far more advantage, if some, by divisions, would lay the Land both warm and dry; others by quick-setting and planting Woods of many sorts, Fruit-trees for Perry, and Sider, or Garden-stuff; improving some Lands by watering, others by draining, and again by Corn, upon perfect and compleat Tilth and Soiling, which none will save, it always bringing great profit, which may be done by those Hands, that are to little or no purpose employed on Commons: other Lands might

might be improved, as I have already directed, by Flax, Hemp, Clover, or the like, and all other means held forth in this Discourse, whereby they may be really serviceable to their Generation.

And this I affirm, That many more People may be employed this way than now are, and to double advantage, and none but the oppressor can be grieved at it, or any way prejudiced; and for such a one, it matters not.

Fifthly, Take a survey of all Inclosures, and take in whole Countries, and you will find more Wealth, more People, and every thing more plenty.

Lastly, For those who meerly live upon the Commons, if they have a proportion allowed them to themselves, as all honest People desire they should, I am confident it would wean a great many from their idleness, and pilfering way of living, to do what work is necessary; out of which will arise Inclosures, and the profits accruing thereby will give them such an opportunity of full employment, that they will have a just cause to rejoyce at the happy change of their condition so much bettered.

Now I grant, as it is but reasonable I should, that all common cannot be aptly inclosed without prejudice to the poor, who must be removed on that account, unless better provision in the mean while can be made for them, and the few Cattle they have; which is to be considered but in very few places, and may well be stinted, or limited, to a set number of Cattle, and such a number too as the Land will maintain to the best advantage; this might in some few cases help, but in the generality little avail; because feeding barely to keep Cattle alive, is no great matter of advantage; but such feeding where they may increase, thrive, and grow fat, is that which can best profit the Owners, and also the Publick; and this cannot be where Ground, that is but poor of itself, is over-stocked; for then, by penury and want, Diseases get among Cattle, as Murrains, Rots, and abundance of others, which in a sound well-manured, and plentiful Pasture are strangers; so that, by such Casualties, a poor Man may at once lose all he has to depend on, and so be brought to want and beggery, never, by his Labour, in his life-time perhaps, being

able

able to recover the loss of one fatal Year. And so, hoping none, from the highest to the lowest, will have cause to cavel at these things, especially if time be taken rightly to digest and consider the Propositions as they ought, I conclude these Points, and proceed to other Matter that may be advantagious to the industrious Farmer, and others who take any pleasure to delight, or advance their own Interest in Rural Affairs; for, intending to make the Book a sufficient Guide to all, I purpose to omit nothing, that may in any tolerable manner be conceived reasonable to profit any, it being a Work indeed that was never before compacted to any purpose, in one Body, and therefore being now reduced to so small a Volume, it cannot but prove graceful to those more particularly whose curiosity, or industry leads them any thing this way, and may be a main Instrument to stir up Publick Spirits, to consider the Publick Good and Welfare of the Nation, in imploying their Purses and Skill in promoting what consequently will abundantly produce Riches and Plenty.

Reader, I shall here a little further trespass upon you, to let you know how to take or destroy other Creatures than what I have mentioned, that are great Enemies to Corn and Under-woods, Clear-water, &c. which may turn to your profit and pleasure, in the proper Seasons, after your Toil and Labour.

CHAP.

CHAP. LXI.

How to take the Stag, Buck, Hare, Fox, Badger, Wild-Goat, and Otter, which destroy Corn, Underwoods, &c.

THE Stag is the most Princely of all Games; and when you go about this, to know whether he be or young, observe the Prints of his Feet where he has ked the soft Ground; and, if it be large, with a thick l, open Cleft, long Space, and a deep Print, he is ainly old; but, if the contrary, you may venture upon for a young one.

nd the principallest Quality being to know at all Sea- where to find this Game, observe this Rule, *viz.* In *ember*, seek among the Whines, thick Shrubs, or rs; in *December*, in thick Woods; in *January*, he is llest to be found in the Corn-fields; in *February* and *ch*, among the thick young Bushes; in *April* or *May*, opices, or near Springs; in *June* and *July*, in Our- ds, and the Purlews on the Edges of Corn-fields; in *ember* and *October*, after the first Falling-showers, he to rutt.

When you are in search of him, go against the Wind, he may not scent you, and hastily remove. Sun-rise the best time to find him, when, having watched him his Lare, you may assuredly find him there till the R- ing, unless rousted by some Affrightment.

As for the manner of hunting him: When you ap- ch somewhat near, send out your Finders; and when have hunted about a Ring or two, cast in the rest of Hounds, and cheer them with your Horn and Voice, n they are at Full Cry on the Main Chase; and take notice of the Stag, that you may know him, if Dogs should follow a wrong Game, that you may m off, and set them back to their Default, making them

them cast about again till the first Game is again undertaken, and then chear them as before; and have a watchful Eye he beat not up another Stag; for the Stag hunted being imbossed and wearied, will, if he can, beat up another, and, lying down, skulk closely in his place.

You may perceive when he is weary, by his slavering and frothing of his Mouth, much Sweat, shining and blackness of his Hair, and often lying down; and for his last Refuge, he will betake himself to Ponds, Brooks, Rivers, or any Stream, out of which he must be forced by Strength or Policy; and so you having the Game you sought for, are at the end of hunting him.

Of the Buck and Hare; the manner of finding them, &c.

As to the Buck, your business is to take your Measure according to the Advantages or Disadvantages of the place where the Buck is imparked, or in Chaces; and this is more easie to be taken than the former: And if you can hunt the Stag well, by the same Rules, with less Trouble, this may be run down.

But what is most the honest Countryman's Sport, is the Hare; and therefore I shall be large in my Direction upon her, as to the finding and running her down.

If you seek her in Champion Countries, you must beat the most likely Bushes and Covertures; as, Brambles, Brown Grass or Brakes: And if there be no such Shelter in the beginning of Hunting-time, repair to the Stubble and to the Fallows about *Christmas*; but in *March*, to the Green Corn, which are her most likely Haunts; especially of the largest and best Hares.

There is another Rule to be taken in finding the Hare, and that is, to repair to her former Seat, and observe whether it is new or old; if it be plain and smooth, and the Pad before it worn and flat, and the Pricks new, and to be seen, and the Earth appear black, as if it were newly broken, then it is new, and she is not gone so far from it, but you may expect her to return: But if the Mark

ear otherwise, then conclude she has left it for a consi-
erable time; and if the Hounds have taken any Scent,
nd open, then call them off; for unless a Hare acciden-
lly start, you will lose your Labour.

The Hare has Slights almost more than any Creature
at is used to be hunted; for she will make many Dou-
gs and Windings to avoid the Pursuit, which you must
ll note and observe, or you may chance to lose her;
erefore you must at every Default give your Hounds
ope and sufficient Leasure in casting about their Rings
the Windings of them; and after this, observe her
ips, and the Skips which she makes, before she quats;
n with your Pole beat the places where she is most like-
to sheltre; for being reduced to these necessitous Shifts,
is at her last Cast, and has but a little time to hold
, nor can be long out of your Possession. And thus
ch for all that is material in Hunting the Hare, as far
Directions can be given in Print.

Of the Fox, Badger, and Wild-Goat.

THE taking the Fox, Badger, and Wild-Goat, are
other Recreations in some places of this Kingdom
ly in Esteem; and there is very good Sport to be
nd in it, though the Quarreys are of no Value, ex-
t their Skins.

As for the Fox, he is a subtile cunning Creature, not
y to be circumvented; his Resting-place is generally
e Ground, or some hollow Tree, but mostly in the
er; and when once he's unkennel'd, stop up the
, and cast in your Fox-dogs, who by reason of the
g or burning Scent he leaves behind him, cannot
if once they have taken it, to follow him in the
Track; keep him, if you can, from getting into the
ds; mark his Mocks, Wiles, and Leaps, that so you
be the abler to deal with him, though he be a
one: He will lead you a weary Journey over
and Hills before you can run him down; and if he
you must send in your Tarrier after him, if the

Hole

Hole be wide enough, or else dig him out. His Haunts are so uncertain when he is a roaming, that Directions cannot well be given about it; and you may sooner light on him by chance out of his Hole, than when you go purposely to look for him; and that will be by the Dogs happening to light on the Scent, which is very strong.

The Badger is a kind of Wild-dog, living in Ground like the Fox, but not so hurtful to Cattel and Poultrey. His Haunts and Coverts are usually in Woods or bushy places. The Dogs must be hardy and bold that venture on him; for he is strong, and a very shrewd Biter; and, for the last Refuge, when almost run down, hasts to his Hole; but finding it stopped, as it must be, if you intend to take him, he will set himself against it, and fight very couragious, even to Death. He is a Heavy Creature, and by the Unevenness of his Legs, as some allow it, of no swift Flight, and therefore soon overtaken in the Pursuit.

As for hunting the Wild Goat, it is much used in *Wales* on the Mountains, but a very dangerous Exercise to pursue among those scraggy Rocks. This is a Creature that is not in those steep places easily taken; for neither Dogs nor Men in some places can follow her, where she will run on the sides of the Rocks like a Cat; so that, hallowing and making a noise with Horns, they watch at her Boltings places, or steep comings down, and so seize her with the Dogs; and if it be a young She-Goat, this hunting will render her as tender as Venison.

Of the Otter.

THis Otter is a Creature that lives as well by Water as Land, and is a great Devourer of Fish. Having set her from her Holes in the Banks, if you can keep her on the Land, she is presently taken; but upon any Fright, if possible, she will take the Water, especially being pursued; and if the Dogs be good, they will pursue her there, and dive after her, till she comes to ve[illegible] and then her best a past; for then, if the Water be

too deep for Horſes to enter, ſhe may be eaſily ſtruck with an Otter-ſpear, and taken.

As to the taking of other Creatures, that are great Enemies to the induſtrious Huſbandman, Farmer, *&c.* in their Corn, Underwoods, Fiſh-ponds, Rivers, and other things, I, for Brevity's ſake, refer you to my *Vermin-killer*, in my approved Book treating of *Domeſtick Cattle*, and many other profitable things.

THE

Countryman's Almanack

SHEWING

Many things necessary and profitable to be known in relation to Weather, &c. And what is proper to be done in Rural Affairs, in many Particulars, throughout the Twelve Months, &c.

Signs of Weather. And First, Of Rain.

This is to be observed by the Face of the Heavens, and divers Creatures, viz.

When the Sun shews broad in rising, as through a Mist, and has a Circle about it.

When it sets in a black or dusky Cloud, and scatters its Beams.

When the Moon is pale, and blunt-horned, near the Change.

When a fair Morning changes to grey, or marble-coloured Clouds, suddenly being overcast.

When the Wind often shifts and changes, and holds long in the South.

When the Stars are dull, and Circles seem to appear about them, or the blackness or grossness of the Air, where little scattering Clouds appear at Northwest in the Evening.

When

When the Crow flies low, casting his Head often upwards, and makes an unusual Noise; when Cattle often look upward, and snuff the Air sometimes, lowing heavily, and making towards shelter.

When the Sea-Pies fly low, and dip, as it were, into the marshy Waters or Rivers, making a great Noise.

Signs of Fair Weather.

WHen the Sun rises bright, and Mists are on the Water, and the Rain-bow appearing after a Shower, shews very light in the Azure or bleuish part.

When the Sun sets red, and casts direct Beams; and there are Webs flying in the Air, or contracted by the vapours on the Grass.

When the New Moon is sharp pointed, and shines very clear; when the Clouds look clear, and are inclosed about the Edges with a golden Colour, the Sun being screened behind them.

When Birds of Prey fly very high, and Cattle graze freely, without looking up, or seeming to be offended.

When Owls cry clear in the Night, and have no hard Stammering in the Noise they make.

If in Summer, observe the busines of the Bees, and how far they fly from their Hives; for if they abroad and richer Rain or Storm, they never keep near their Homes.

Signs of Windy Weather.

EXpect Winds to arise when Sea-fowl begin to flock to the Shoar.

When there is a rushing Noise heard in Woods, without any feeling of Wind; for that is a Sign the Vapour is not out of the Earth, and the Air is already seized of it, that soon will create strong Winds, if not vio-

When a dusky Redness appears in the Moon and Sun, and Meteors by Night thwart the Stars, expect the approach of great Winds.

When the Sea-Waves beat with a hollow Noise against the Rocks, and sounds as it were at a distance, and the swelling seems high and bright, then Winds are gathering.

When a Red Morning suddenly changes, and the Wind thereupon shifts its Quarter or Point, then expect the Wind will suddenly arise.

Signs of Frosty Weather.

IT foretells Frost, when the Sun sets red in the Winter, and the Air is clear or misty at a distance.

When the Stars shine bright, and twinkle much, seeming to send Darts and Rays to the Earth.

When the Moon in Winter is sharp-pointed, and a bright Circle, though very small, encompasses her.

When Meteors glide Northward, and the Wind continues in a cold Point; for then it will continue long without alteration.

When Starrs, Feldfares, and other Birds, used to the Countries, flock towards the South.

When Cattle turn their Tails to the Northward, and lie incessantly for a considerable time, holding down their Heads, without regard to grazing.

Signs of Snowy Weather.

WHen in a Wind the Clouds move slow and heavily, and seem of a dusky white in the middles, and where any broken parts are fleecy and whiter at the Edges.

When there is a spreading of the Clouds of one Colour grey and dull, and the Earth appears to be darkly covered.

C

Signs of Hail.

THis a Sign of Hail when the Sky is suddenly overcast and there is a noise of rushing heard in the Air, caused by the Vapours of contrary quality being closed in the Clouds, which strive to break and shiver into Particles the ponderous Body of congealed Vapours pressing towards the Earth, which is its proper Center: And as the Cold is greater or lesser, so are the Hail-stones: And this mostly happens in the Spring and Summer, because the Vapour is more forcibly sent up; so that reaching the cold Region, it is frozen there; which in Winter, the Vapours being thinner or flagging, do not, and therefore are convertible into Drisle or Snow.

The Measure of Time.

THE Measure of Time ariseth from Minutes, and of these 60 make an Hour, 24 Hours a Natural Day, 7 Days a Week, and 4 Weeks a Month, 13 such Months a Day and 6 Hours a Year; but this Year is usually divided into Twelve Calendar Months: However, their number of Days are many of them unequal, as in the following Verses:

Thirty Days hath fruitful bearing September,
With April, *but* June, *and cold* November;
Short February *Twenty Eight alone,*
The other Months each claimeth Thirty One:
And February, *when its fourth Year is run,*
Does gain a Day then from the travelling Sun.

So that by this Rule *February* every Leap year has 29 in it, and that Year must consist of 366 Days, being a Day more than other.

The Year is again divided into 4 Quarters, viz. The first of the Annunciation of the Virgin *Mary*, *March* 25.

The Feast of St. John Baptist, usually called *Midsummer-day*, *June* 24. The Feast of *Michael* the Archangel, *September* 29. The Feast of the Nativity of our Blessed Saviour, usually called *Christmas*, *December* 25.

Moveable Feasts, by reason there are some Days that vary and move, falling higher or lower, according to the Change of the Moon, as *Shrove-Sunday*, *Ash-day*, *Ascension-day*, and *Whit-Sunday*, I shall give my Reader an Account how they fall out as to the exact Days of the Month, from this Year 1697, to the Year of our Lord 1703. and of the Moveable Terms to the like Date of the Year.

Year.	Shrove-Sun.	Ashes-day	Ascension-day	Whit-Sun.
1697	Febr. 14	April 4	May 13	May 23
98	March 6	April 2	June 2	June 13
99	Febr. 19	April 7	May 25	May 25
1700	Febr. 11	March 27	May 9	May 19
01	March 3	April 20	May 29	June 9
02	Febr. 16	April 5	May 14	May 24
03	Febr. 7	March 28	May 6	May 16

Year.	Easter Term		Trinity Term	
	Begins	Ends	Begins	Ends
1697	April 17	May 17	June 4	June 21
98	May 11	June 6	June 24	July 11
99	April 26	May 22	June 9	June 26
1700	April 18	May 13	May 31	June 18
01	June 7	June 2	June 20	July 7
02	April 23	May 18	June 5	June 23
03	April 15	May 10	May 28	June 15

Observations of things produced by Natural Causes.

As Blazing-stars, &c. and the Causes.

Comets or Blazing-stars, so amazing to the World for their appearance, because they are frequently the Forerunners of dreadful Consequences, as War, Famine, Pestilence, &c. proceed from no other than Natural Causes; viz. the ascending of unctious Vapours gathering in a Body in the Superiour Region, and there by their near approach to the Region of Fire, and the influence of the Stars, are agitated into a flame, which, when the Sun-beams are excluded from it by the Shadow of the Earth, appears like a Star. Hence Comets or Blazing-Stars are held to betoken Drought, Barrenness of the Earth, and Pestilence.

Drought, because a Comet cannot be generated without great Heat, and much moisture is consumed in the forming of it.

Barrenness, because the Planets of the Earth is drawn up where the Comet continues.

Pestilence, for much as this kind of Exhalation corrupteth the Air, which infecteth the Bodies of Men and Beasts.

And indeed, it is generally noted by Historians, that after the appearing of Comets, great and notable Calamities befal Mankind; as indeed is not now out of the Memory of Men, as those that appeared in 1665, before the great Plague, &c.

Of Stormy Winds.

A Stormy wind is a thick Exhalation violently moved

It always goes before a violent sudden Shower; for while the Cloud is rent, as it were, in pieces, the Water must consequently fall down also; and so much the more, that it darkens the lowest Region of the Air, and [illegible] Winds are usually [illegible] Thunder, and many other Calamities.

Ignis Fatuus, or Foolish Fire.

This is usually by the Country People called [illegible] with a Proverb. It is a kind of Vapour arising from Moorish places, and exactly [illegible] for a little Degree above the Earth, as being [illegible] by the cold unusual Air; yet when the Air is [illegible] by any one's coming towards it, it presses forward and backward, and seems to dance about a while, [illegible] the Darkness of the Night, joined to Fear, [illegible] to amuse the Minds of many, that they have wandered out of their way into Ditches, Pools, or Waters, till Daylight, which a [illegible] Mind would soon have prevented.

Of the Eclipses of the Sun and Moon, with their true Causes.

The Sun, the chief Planet of Light, much greater than the Earth, as any other visible Body, makes its Course through the 12 Signs of the Zodiack in 365 Days properly, and in 24 Hours encompasses the Earth; and by its kindly Heat is, under God, the Nourisher of Plants, Trees, Flowers, and indeed, all Created Beings [illegible] Vertues. Yet this [illegible]

The Cause of the Moon's being Eclipsed, which happens always a little distant from the Full, is the Interposition of the Earth's Shadow between her and the Sunbeams; for, rising like a Pyramid, it reaches her opacous party and she being a Body of herself without Light, can give no Reflection of the Sun-beams, till passing on, she recovers the refreshing of its Light: And though many from these Contingencies make strange Prognosticks, yet, proceeding from Natural Causes, I think they signifie no great matter as to Transactions on the Globe of the Earth.

Of Whirlwinds.

A Whirlwind is a Wind hurling out of a Cloud, breaking or rowling round about, often overthrowing that which it meeteth in its way, by reason of its intense violence, carrying things not exceeding a certain weight with it in the Air.

The Matter of a Whirlwind is not much differing from the Matter of Storm and Lightning, that is an Exhalation hot and dry, breaking out of a Cloud in divers parts of it, which occasions the blowing about; also it resists the Air to its body against its Violence, and for breaking through, it comes with the greater Force.

Of the Rainbow.

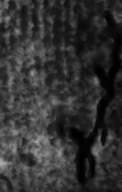
THE Ground or Reason of the Rainbow, is only the Sun's Reflection on a hollow Cloud, which, (the Sun being behind it) and beaten back against the Skie, thence arises the so great Variety of Colours, by reason of the mixture of Clouds, Air, and Fiery Light. Thunder and Lightning are caused, when hot Exhalations inbut with Moisture, accumulated up in the Region, and there exhaled into the Body of these two Contraries not agreeing together, with great Violence, so that the Fire and

Watery Cloud form'd of the Clouds, making a roaring Noise, which we call Thunder; and the Fire flashing, the Thunder is first made, but the Lightning first seen, in regard the Sight is quicker than the Hearing: Which to prove, observe at some distance, when a Man is cleaving of Blocks, or a Carpenter hewing a Log, and you shall see the Fall of the Beetle or the Axe before the Difference of Time betwixt you hear the Noise of the Blow. Many of Lightning there are many sorts; some which in any Corneth not at all, but dissipateth and dispersheth itself: Likewise the moist burneth not, but stains, and changeth the Colours. But the clear is of a strange Property; for it melteth the Sword, and singeth not the Scabbard; it draweth Vessels dry, without hurt to the Vessels. Some rich Misers have had their Silver melted in their Bags or Purses, and [illegible] Lightning, [illegible] Cattle, [illegible] Cattle have we then to pray, as it is in the Litany, [illegible] Cities, Towns, and Steeples, by reason of Height, are seldom molested with Lightning.

Of the Nature and Properties of the Seven Planets.

Saturn (the highest of the Seven) being well affected, is grave and Authority, Governor of great Masters, a Lover of Servers, full of Cunning and Toil, covetous and studious for his own Benefit, succellant in his Words, [illegible] and a Lover of Husbandry, a great Scraper together of Wealth; being ill affected, he is fearful, sly, envious, [illegible] deceitful, [illegible] Lies.

Honesty, maketh them religious, just, heroick, faithful, and magnificent; [illegible] grave and wise, studious [illegible] liberal upon discreet occasions, without Dissimulation, but being ill affected, unfortunate and [illegible] and Prodigality, [illegible] generous, [illegible] Riches; being contrarily affected, he is unjust, cruel, a Tyrant, proud, rash, turbulent, a Blood-shedder, and an Author of all Dissentions and Discords. The most noble Planet is *Sol*, being well affected, signifieth Kings, Princes, Potentates; he is heroick, and [illegible] provident and ambitious, delighting in Wealth, valiant, secret, quiet, and honest: He giveth long Life, and a healthful Body, a judicious Mind; he giveth Honours, Dignity, and Riches; and (which is most of all) he maketh Men famous and desirous of Honour. Venus being fortunately affected, maketh one beautiful, pleasant, fair-spoken, delighting in gorgeous Apparel, eloquent, pitiful, apt for to please, sociable, excelling in Musick, impatient, reserved, but, being ill affected, she is libidinous, a Lover of Lovers, idle, envious, sluggish, regardless of Shame, fearful, and prone to all Evil. Mercury well affected, maketh one wise, studious, and apt to all Learning, [illegible] and wary, skilful in Poetry, Geometry, and the Mathematicks; given to Law, desirous of Difference, and Eloquence in Disputation; but, being unfortunate, he is malicious, subtile, crafty, forlorn, and a desperate Liar. Luna, of the Moon, [illegible] fearful, fainthearted, fearful, a Vagabond, and prodigal. She delighteth in the Study of Romances, to walk from place to place, to travel far Countries, and to plant Herbs and Trees; she also signifieth Messengers, Seamen, Ladies, Millers, and all such as be in continual Motion.



phlegmatick. *Septentrional*, or the North Wind, is cold and dry, driving away Rain, causeth Cold, and procureth Health; it is destructive to the Flowers of the Earth, and causeth Whirlwinds, thick Snow and Rain. *Auster*, the Meridional and South-Wind, is hot and moist, compared to the Air, causing large Clouds and great Rain. *Aristotle*, and his Sect, define this Wind to be a hot and dry Exhalation, ingendred in the hollow Concavities of the Earth; and the Reason why, [illegible] the Motion thereof is not right upward and downward, but as side-long, is because that whilst by his Heat he striveth to mount up, and carry his Course through the three Regions of the Air, the middle Region, by reason of its Cold, doth always beat back the [illegible] other Exhalations arising out of the Earth, [illegible] forced to be gather'd [illegible] why it bloweth more sharply at one time, than another, and at some times not at all, according to the Fumes that arise out of new Exhalations out of Woods, Rivers, and Marshes, which augments his Force, the Decay of may either allay or increase it. [illegible] Hills, and Woods, (by reason of the [illegible] may hinder its Force from blowing [illegible] whereas upon the plain and [illegible] great Force; concerning the [illegible] sons might be assigned; as the [illegible] of the Earth, from whence it [illegible] drying up the Fumes and Vapours that should increase it.

Sixth Winds first Half South Winds Main.

East Winds are hot and [illegible]

North-East is very cold, [illegible]

North-West is cold, South-West hot and [illegible]

Of the Nativity of our Lord, falling on any of the Seven Days in the Week; thereby shewing the Disposition of the Year.

If the Nativity of our Lord fall on a *Sunday*, the Spring shall be windy, Summer moist, and a plentiful Harvest, Peace and Plenty shall greatly increase, Beasts shall be fruitful, Men shall be valiant, and overcome their Enemies; he that slyeth shall be found, and Theft shall be proved. If it fall on a *Monday*, there shall be great store of Frost and Snow in the Winter, the Spring shall be windy, and the Summer dry; many Sheep shall die, and there shall be great Scarcity of Corn; many Women shall die in Child-bed, and many Children shall die; all things shall be prosperous, and Theft done by Women shall soon be proved. If it fall on a *Tuesday*, the Winter shall be warm and moist, a late Spring, and dry Summer; Fruit shall be scarce, Pestilential Diseases shall reign throughout the Land, (which shall take away Thousands;) Kings shall die, and Sheep shall be scarce; many shall travel, and he that shall travel shall die. If it fall on the *Wednesday*, the Winter shall be [illegible] and windy, Spring shall be wet and windy, Summer dry, with store of Thunder; there shall be great store of Grass, and plentiful Harvest; many shall attain to great Dignity and Promotion; Kings and Princes shall run through many Countries; Young Men shall die, and Cattle shall [illegible]. If it fall on a *Thursday*, there shall be many Frosts, and a wet Summer; Grass shall be scarce, and there shall be great Store of Grass. But if it doth rain on Easter-day, we shall have plenty of Grass, but little good Hay; many Ships shall perish on the Sea, many shall attain so great Wealth by the Practice of the Law, and he that decreaseth shall soon recover. If it be on a *Friday*, there shall be marvellous Floods in Winter, the Spring shall be moist, and the Summer dry; Wine and Corn shall be plentiful and good, Sheep shall prosper, the

small Fruits and Seeds of Gardens shall flourish, many great men shall die, there shall be great Peace and Honour to all Kings and Governours. If it be on the *Saturday*, it shall be a good rainy Winter, the Spring shall be moist and warm, the Summer and Harvest very good Weather, Swine shall many of them die, Sheep be diseased, and abundance of Cattel perish; there shall be great Plenty of Hay, Wine and Corn, but Fruit shall be scarce; many shall die suddenly. Begin no lasting Work on *Saturday*, especially towards the Evening.

That you see I have also annexed this old Prognostication, as I know it to be of Authentick Authority with many, being the chief Delight also of some ancient People, and although I aspire to this purpose, and of which, as could wish, rather by the wise one with a Pot of good Ale

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